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British Railways Manpower Position Improved

THE decision of the National Coal Board temporarily to halt recruitment for the mines draws attention to the improved position as to manpower and staff recruitment both on British Railways and in the nationalised coal industry. For the first time for a number of years, the railways during the past few months have begun to find themselves able to meet the manpower needs of nearly all the departments; the only exceptions have been relatively small numbers of specialists. It is particularly noteworthy that it has been possible generally to meet demands for permanent way staff, though there are bound to be local shortages at times. This is largely the result of the application of work study, which has contributed much to rationalisation in planning works, in assessing the demands for manpower, and in its deployment. In addition, the intake and training of apprentices are proceeding satisfactorily in most departments in accordance with the facilities available and estimates of vacancies for trained staff. Clearly two factors have contributed to this situation. First, there has been an easing of the situation as to labour availability, including, it is understood, some districts where staff had been attracted from the security of the railway service by the higher wages and—perhaps imaginary—relative ease and cleanliness of some light industries. Secondly, British Railways require less manpower, partly because of better use of existing staff as a result of work study and other rationalisation measures, and partly because the reduced freight traffic of recent months has needed fewer men to handle it. As the implementation of the modernisation plan proceeds, resulting inter alia in the gradual turnover from steam to diesel and electric traction, and as increasing use is made of work study, there will be an overall reduction in demands for certain classes of workers. There is no suggestion, however, that redundancy on an appreciable scale will occur, apart from that caused by normal wastage. It is gratifying that the leaders of the railway unions so far have adopted a co-operative attitude based on a realistic appreciation of the situation.

South-East London Suburban Traffic

ANSWERING criticisms made in a series of articles in *The Evening News* on peak-hour travel from and to south-east London suburbs and Kent, Mr. C. P. Hopkins, General Manager of the Southern Region, in a further article last week pointed out that the only complete solution would be "not to tinker expensively with individual bottlenecks" but a pair of extra tracks all the way from Charing Cross and Cannon Street to Lewisham, with more platform accommodation at terminals "at enormous cost." This would be intended for peak-hour passengers only, who, he suggested, might in fairness bear the cost in very greatly augmented fares. To the argument that fare increases should have afforded the money for such capital improvements he replied that most season tickets cost less than twice as much as in 1939—in contrast with most prices. He rightly questioned whether the country could afford the effort to improve travelling conditions for one hour in the morning and at night for one section of the community. On these lines, total business travel has increased by 10 per cent since 1939—but travel during the one busiest hour of the day by 58 per cent. As Mr. Hopkins suggested, here is a case for staggering working hours.

Modernisation in Malaya

IMPLEMENTATION of plans for improving the Malayan Railway is proceeding apace. As a further step towards replacement of steam by diesel traction, the management placed an order with the English Electric Co. Ltd. for 26 1,500-h.p. main-line diesel-electric locomotives, described in our issue of April 5, 1957; 11 so far have been received, and the first of these has been in service since September, 1957, working the day mail trains between Prai and Kuala Lumpur and Kuala Lumpur and Singapore. Installation of fully-interlocked mechanical signalling at all main-line stations had to be halted during the slump in 1932, and stations southwards beyond Labis towards Singapore remained equipped with an elementary form of signalling. It was in this area that the administration decided to install C.T.C., and the specification was drawn up by the Malayan Railway in 1956. Also in view is the extension of C.T.C. northwards from Tampin to Seremban after the more urgent requirements have been met.

Eighth Indian Railway Inaugurated

THE North-East Frontier Railway of India has now been officially inaugurated, as described in our overseas pages this week. It has been formed out of the North Eastern Railway, and consists of a number of metre-gauge lines in the Brahmaputra valley in Assam, in the Duars. and elsewhere in North Bengal, with some narrow-gauge lines of the former Darjeeling Himalayan Railway. Commenting in our issue of November 8, 1957, on the dividing point between the new railway and the residual N.E.R., we expressed the view that Katihar, in east Bihar, the temporary junction between the

systems, was too remote from the headquarters at Pandu, in the Assam Valley. This agreement applies with greater force to Barauni, further west of Bihar, whither the junction with the N.E.R. is to be moved later, when the transhipment yards there are completed. These yards eventually will deal with transhipment traffic to and from the broad-gauge Eastern Railway, of which a branch will cross the bridge now under construction over the Ganges at Mokameh.

Serving a Tanganyika Coalfield

THE retiring Governor of Tanganyika, Sir Edward Twining, announced recently that negotiations were taking place on possible development of the remote Ruhuhu coalfields in the Southern Province; and this raises the question of communications in that area. The Southern Province Line of East African Railways & Harbours runs only 132 miles west from the port of Mtwara to Nachingwea, and a 400-mile extension to the coalfields is estimated to cost some £10,000,000. In favour of this capital expenditure, it can be argued that the existing railway line and port, built for the ill-fated Tanganyika groundnut scheme, are heavy liabilities and that development of the coalfields would bring 4,000,000 tons of coal a year on to the railways. The coal is comparable in quality with that from the Wankie fields, in Southern Rhodesia. It would be suitable for use in locomotives, as has been shown by tests made by both the East African and the Nyasaland Railways. An alternative route, surveyed some five years ago, would run south-west from Kilosa on the Tanganyika Central line, but this would cost nearly twice as much as extending the Southern Province line; nor would it solve the problem of the port of Mtwara. As an alternative to extending the Southern Province Line, it is understood that possibilities are being examined for an Air-Rail system, similar to that proposed for London Airport and described in our issue of February 7.

Indian Integral Coach Factory at Perambur

THE recent "launching" of the 200th coach at the Integral Coach Factory at Perambur, near Madras, draws attention to the fact that at the end of the second year's output 73 more coaches had been turned out than envisaged in the original plan of production. A revised programme was therefore framed showing an out-turn of 240 coaches in the third and 350 in subsequent years; as in the original programme these figures were for single-shift working. Now, however, shortage of passenger stock has made it necessary for the factory to work a second shift and produce 600 coaches a year until the situation eases. Hitherto the policy has been for this factory to construct only the coach shells, subsequently sent to the various railway shops to receive their fittings. Pressure of work on these shops has caused a change of policy, and a furnishing annexe to the integral factory on a 130-acre adjoining site is to be built at a cost of £2,767,500. Its covered area will be 550,000 sq. ft. and it will be able to cope with the full out-turn of the coach-shell factory, and enable 600 coaches ready for service to be produced annually.

Re-equipping the Newfoundland Railways

SINCE they took over the Government-owned 3-ft. 6-in. gauge Newfoundland Railway in 1949, the Canadian National Railways have been active in re-equipping and modernising the system. Details of contracts placed for new rolling stock are given elsewhere in this issue. Reference was made last week to the construction at Corner Brook of a new marshalling yard. Other motive power, including diesel-electric locomotives, and rolling stock are due to be placed in service this year. When on April 1, 1949, the then Dominion of Newfoundland became the 10th Province of the Dominion of Canada, its economy, and the railway that served it, were in poor condition. The fact that it should now be considered worthwhile to invest heavily in improving a narrow-gauge system shows how prosperity is being achieved: most other narrow-gauge lines in Canada and the U.S.A. have been closed as uneconomic. The exploitation of Newfoundland ore deposits is adding to railway freights. The development of the Province, largely with capital from the United Kingdom, is an example of what can be done to open up under-developed territories of the British Commonwealth.

Improved Facilities for Rural Lines

IN an endeavour to maintain and create passenger traffic over branch and secondary lines, British Railways have ordered lightweight railbuses. The first to be delivered, designed and constructed by A.C. Cars Limited, is described on another page. In all, 22 of this class of vehicle are being built, and it is intended to introduce them for trial in four Regions: Eastern (5), London Midland (4), Scottish (9), and Western (4). The British Transport Commission rightly believes that the use of railbuses "may well enable the continuance of passenger services in rural areas which cannot be run economically with present types of diesel trains." With these vehicles it should be possible to make branch line services flexible and convenient. These advantages already are possessed by the road bus, the possibility of introducing extra rail-side halts on the routes as traffic conditions may require will be investigated by the various Regions concerned. The conception of the railbus has necessitated design features unusual in British railway practice. The most obvious are the absence of usual buffers and drawgear, and the four wheels. With a tare weight of some 11 tons, there is a seating capacity for 46 persons. To gain springing characteristics which will give acceptable riding qualities, use is made of rubber suspension between underframe, body and axleboxes. On the trial run, however, one could not help feeling the lurch probably inherent in all two-axle vehicles.

A Misunderstanding in Shunting

THE accident at Portsmouth & Southsea on April 15, 1957, when empty stock being propelled towards the station ran off at trap points and struck an outgoing train, with considerable damage to one coach and serious injuries to four passengers, arose from a misunderstanding between shunter and driver. Colonel W. P. Reed, whose report is summarised in this issue, could not reconcile the conflicting evidence; but he concluded that the driver must have acted on a gesture made by the shunter which seemed to him to be the irregular version of the calling back signal which the staff there had been in the habit of using in place of the one laid down in the Rule Book. It was hard to believe that the shunter would knowingly have called the empties back in the prevailing circumstances, but his account of his actions was not very clear. The accident stresses the importance of adhering always carefully to the prescribed ways of giving hand signals, even the simple ones used in station duties.

North British Diesel in Western Region

THE demonstration run to Bristol last Monday of the first of five 2,000-h.p. diesel-hydraulic locomotives built by the North British Locomotive Co. Ltd. for British Railways, Western Region, is recorded elsewhere in this issue. One of the main advantages claimed for the diesel-hydraulic system as against the diesel-electric, is that the hydraulic equipment is considerably lighter than the electrical, so that a substantial reduction in weight can be achieved with consequent economies of operating costs. Some recent diesel-hydraulic locomotive designs, such as the V. 200 of the German Federal Railway, have shown weight savings of up to 30-40 per cent compared with conventional diesel-electric units. In the case of the Western Region locomotive, which incorporates N.B.L./M.A.N. 1,100-h.p. 1,500 r.p.m. engines and N.B.L./Voith hydraulic transmissions, the fullest use does not seem to have been made of the weight saving characteristics of this combination of lightweight engines and hydraulic trans-

mission. The total weight of 117 tons is no more than 5 or 6 per cent lighter than that of a diesel-electric. A description of the locomotive appears on another page. Of the 130 diesel-hydraulic units of 2,000 and 1,000 h.p. required by the Region for its initial diesel conversion programme, 34 of 2,000 h.p. remain to be ordered; these are to be of B-B wheel arrangement with a weight of some 80 tons, similar to the 30 already ordered from Swindon Works, so that appreciable progress will thus be made.

Closing Unremunerative Branch Lines

As was to be expected the Central Transport Consultative Committee has endorsed the proposal of the British Transport Commission that the Southern Region line between Lewes and East Grinstead, sometimes called the "Bluebell Line," be closed. After nearly four years' delay, caused by pressure in and out of Parliament, services on this unremunerative line are to be withdrawn on March 17. The procedural delays which have prevented earlier action were described in our issue of July 12, 1957. When closure was first proposed in 1954, in accordance with the usual procedure, the matter was referred to the local Area Consultative Committee, which approved the closure and had its decision confirmed by the Central Committee. A local resident then unearthed a statutory requirement that four trains be run in each direction daily and the line, after being closed in June, 1955, was re-opened the following August. The Commission then sought in a Private Bill power to close the line and, after lengthy hearings before it, the Parliamentary Committee on the Bill made a special report to Parliament and recommended an independent inquiry into the matter.

The Minister of Transport & Civil Aviation, Mr. Harold Watkinson, wisely rejected this recommendation, as it would have meant by-passing the consultative machinery; he elected to refer the proposal once more to the Central Committee which he directed to hold a special local public inquiry. This was held in Lewes last October. For the second time the Committee now approves closure. There may have been unusual circumstances in this case, but it is most unfortunate that when the Commission proposals to eliminate unremunerative facilities are subject to such public resistance it is compelled to keep them in operation long after the case for withdrawal is proved. The Commission estimated savings of £60,000 a year from closing the line. This delay has cost it dear.

In the event the Committee disputed the extent of the saving and this re-submission of the case to it has had a useful incidental result. Attention has been drawn to the costing formulæ used by the Commission when estimating losses and produced in evidence to justify closure. In particular, the Committee questions two items in the estimates: the application of general averages of a Region to operating costs without regard to local conditions, and the way in which interest savings are calculated. In the latter case the Commission evaluates the line and equipment on a capital basis and claims allowance for interest on that capital as part of the saving to be effected from closure. It justifies this on the grounds that if the line were scrapped, the Commission would be relieved from the obligation to find the sinking fund instalments for renewals.

As in practice, however, no such fund exists and nothing is set aside for eventual renewal of the line, the Committee concluded that this was not a proper figure to put in in support of a case for closing a branch line unless there were an appropriation from actual profits of the system as a whole. Re-calculating the savings after making adjustments for these two disputed items of averaging costs and interest on renewals the Committee reduced the Commission estimates from £60,000 to £33,000 a year. It concluded none the less that savings of this order justified the line's closure.

It is as well that attention should be drawn to the manner in which estimated savings from the elimination of unremunerative lines are calculated. In this case they are so great that even after adjustments which reduced them by nearly one-half, the closing of the line was still justified; but there may be cases where a re-calculation on the basis recommended by this Committee would have led to a different conclusion. In the withdrawal of services in the Isle of Wight, for instance, the Commission figures were vigorously challenged. The Committee has accordingly made recommendations about the information to be furnished by the British Transport Commission in support of future proposals to withdraw services, and discussions are to be held with the Commission to work out a more satisfactory formula. The Committee suggests that the information provided should include the actual net outgoings which would cease to be incurred, including provision for essential renewals which would have to be incurred in the subsequent five years; the net income likely to accrue from the release or realisation of assets, less any continuing or additional expenses after closure; and the current revenue. These requirements seem reasonable. It is to be hoped the Commission will find them so, because the pressure against closure of unremunerative lines is often so great that there should be no grounds for questioning the accuracy of the estimates.

The Recent Development of A.T.C.

A REMARKABLE conclusion may be reached from a study of a paper read on February 12 before the Institution of Signal Engineers. It would appear that outside non-technical opinions may influence the outcome of a design defined by authoritative remit. The paper, entitled "The B.T.C. System of Automatic Train Control," which was read by Mr. John H. Currey, Signal & Communications Development Engineer of British Railways Central Staff, was delivered as our last week's issue was going to press. Consequently, our report was necessarily confined to extraction of technical points and the inclusion in our Contracts and Tenders section of details of contracts placed for initial supplies of components called for in connection with the adopted system of A.T.C. We are now in a position to comment more fully on Mr. Currey's paper. In doing so we would draw attention to the clear and specific terms of the Railway Executive's remit of 1951 relating to the design and manufacture of the new automatic train control. These were as follow: (1) Link between track and vehicle to be inductive. (2) Vehicle equipment to be ex-G.W.R. modified to work with an inductive link to the track. (3) No visual indication to be provided.

It appears from Mr. Currey's paper that only the first of these requirements has been met by the new equipment. From preliminary tests made on locomotives fitted with modified Hudd receivers and G.W.R. cab apparatus the designers claim to have proved the impossibility of obtaining a loud siren and effective brake with the standard vacuum ejectors. The Great Western system maintains a higher vacuum in the train-pipe than do other Regions and it may well be that this fact is significant. Consequently, a balanced brake-valve as used with the Hudd system was fitted. It is difficult to imagine a valid reason, particularly with regard to the specific terms of reference of the Railway Executive's remit, why a greater degree of Great Western practice was not retained in the new equipment. Nevertheless, the British Transport Commission decided this matter for itself and without the influence of outside lay opinion.

In the instance of the third term of the remit, which was completely ignored, this was not entirely the case. It was clearly stated that no visual indication was to be provided—a decision presumably influenced by the long safety record attained by the A.T.C. at present in use on the Western Region. This does not incorporate a visual indicator. Despite the proviso, the designers, convinced from experience with the Hudd system that a visual indicator was of the greatest value, have incorporated this item in their equipment.

The initial trial of the new system took place very shortly after the Harrow accident of 1952, when technical and public interest was particularly focused on automatic

train control. In his paper, Mr. Currey states he was "flabbergasted to find most of London's Press photographers on the platform." There must have been many who were even more surprised to see the photographs reproduced in the next morning's newspapers. These gave prominence to the cab indicator. The trial had been completely successful and this fact was reported in the account which accompanied the illustrations. The unavoidable impression gained by the public, therefore, was that the indicator had to a great extent contributed to that success. It was consequently difficult to explain that it should not have been there and would not be fitted in future. It is perhaps more than a coincidence that subsequent experience has convinced responsible authority that the indicator is a valuable adjunct to the audible warnings.

As a result of successful runs with this unit, the order was given for 54 locomotives to be similarly fitted. Despite protests from the designers that the unit was only a component and the remainder of the equipment merely a hook-up, this order was enforced. While the apparatus was being constructed numerous defects were discovered in the driver's control valve and many modifications were made. During the next twelve months no further design work was possible because of the necessity of correcting faults in the temporary equipment, and it was not until some months had passed that sufficient reliability had been reached and the equipment re-designed and built. During the interim period, the temporary equipment broke down and practically all the locomotives had to be stripped of their A.T.C. apparatus. At this stage it might well be wondered again why closer adherence had not been made to the G.W.R. system. This had been applied successfully in the past, and is still functioning satisfactorily without the expensive modifications apparently necessary to the system adopted by the B.T.C. It is of still greater interest to consider the flagrant manner in which the directives laid down in the 1951 remit have been disregarded, and to speculate on the extent to which this action has been consolidated and made final by the non-technical Press. It may seem extraordinary to signal engineers and footplate men alike that a factor of this kind could have influenced a fundamental feature of a technical design, and there is no doubt that much interest would attend an explanation of the reasons which caused those in authority to alter their opinions. The disclosures made in Mr. Currey's paper cannot but cause grave uneasiness in the minds of responsible technical people as to the influences which are allowed to bear on matters of this kind.

Britain's Railway Queen

PERHAPS it is significant that, despite the numerical decline of monarchical governments, the popularity of the symbolic Queen has increased. Especially during the summer months there is almost daily creation of Royalty by industries so diverse as to have few other factors in common—and, of course, there are always the seasonal and Beauty Queens. While it is true that some of these celebrities hold traditional offices, it cannot be generally claimed that they rule except to grasp brief glory either for their communities or for themselves. This is not the case with Britain's Railway Queen. The present regnant, Miss Teresa Boyden of Peterborough, has been chosen like her predecessors to carry out a difficult and often arduous task. Her duty is to foster and maintain peace and goodwill between railwaymen of all ranks and nations. This she does by travelling to widespread points, where she addresses meetings attended by officers and men thus brought together in a spirit of comradeship.

The idea of the Railway Queen was formed in 1925, the centenary year of the Stockton & Darlington Railway and a time of bitter wrangling between management and men. A small party of Liverpool shunters was on its way home, tired and discouraged after a difficult meeting with management. The men, discussing the need for a symbol to express their wish for a satisfactory and peaceful outcome to their negotiations, saw three girls playing in the street. One had draped a rag of net curtain over her head and the others were pretending to pay homage. That scene gave the men their symbol—a child as a focal point for the driving forces of peaceful co-operation and comradeship and a consequent better approach to the problems of the future of the industry.

Support from management was wholehearted, and an office was immediately put at the disposal of the men. It would be misleading to recall individual encouragement since, during the entire thirty-odd years of the movement's life until the present, it has received the willing and enthusiastic help of almost the whole of railway personnel from top administration to humblest labourer. The qualification "almost" unhappily must be made, since in 1925 as now there was a small but determined group intent on sabotaging good relations between management and men. Despite organised action from this section, however, the work of the Railway Queen continued. Contact was made with the owners of the Belle Vue Gardens at Manchester. Co-operation was agreed and subsequent organisation so successful that 60,000 people came from all over the country to watch the first coronation. This success has been repeated yearly at Belle Vue, where all Railway Queens are crowned.

The General Strike of 1926 did not destroy the basis of the movement, now even more determined to pursue its aims. A decision was taken to broaden the scope of the work to include colleagues on railway systems overseas and, in 1927, Miss Mabel Kitson paid the first visit abroad to Paris. The management of the Nord Railway presented her with the first link of the international chain of office, which is illustrated elsewhere in this issue. This chain is a visible embodiment of the movement's purposes—the furtherance of unity and goodwill between railwaymen of all races, creeds, and colours. Today, this link has been joined by others. The design, chosen to symbolise friendship and because it represents a railway component in world-wide use, is in the shape of a screw-coupling. It bears the name and year of the Railway Queen to whom it was presented and the name of the country in which it was received. Fifteen countries so far have contributed to the chain, including Germany, Palestine, and the U.S.S.R. Particularly in Russia, where many public receptions were arranged, and in Palestine, where differences arising from the practice of three religions might have been expected to sound a note of discordance, the Queen enjoyed a successful tour. An independent link contributed by children of N.U.R. members is also included in this chain and the latest addition is an emblem presented by the United Nations Association. This is also of gold and bears an enamelled representation of the world. Until last year the international chain was worn as the Chain of Office. In 1957, however, Sir Brian Robertson, Chairman of the British Transport Commission, presented the Railway Queen with her official chain, again of gold and bearing the emblem of the Transport Lion modelled in low relief against an enamelled background of blood-red.

The independent and completely impartial character of the movement which has always been one of its most valuable features has been carefully safeguarded. The Railway Queen's Council, which forms the "Cabinet" of the movement, is elected annually by and from a National Assembly of 40 Area Delegates. These delegates, who are members of the N.U.R., A.S.L.E.F., and T.S.S.A., come from all parts of the country and form the general parliament of the organisation. Council members retire on rota after a period of three years and are eligible for re-election. The Chairman and all other officers, including the Council Members retiring on rota, are elected annually. To maintain continuity, the General Secretary is not elected annually, but fills a permanent office, although, in the event of misdemeanour, he can be deposed. There are two Joint Presidents, one of which must be a member of top railway management and the other a member of top trade union administration, and who jointly officiate at the Crowning ceremony. During the current year, the Joint Presidents are Sir John Benstead, Deputy Chairman of the B.T.C., and Mr. W. J. P. Webber, General Secretary of the Transport Salaried Staffs' Association. Vice-Presidents this year

include Members and Officers of the British Transport Commission, all the six General Managers of the Railway Regions together with six Assistant General Managers, 11 Members of Parliament who are also railwaymen, five top trade union officials, and 44 railway officers from various Regions. All necessary funds are provided by members of the movement and individuals invited to preside are expressly requested not to send a donation with their reply. The same impartiality governs the yearly choice of the Queen. This is done by an independent committtee on which no member of the Queen's Council may serve. Qualifications for nomination include the requirements that the applicant must be between the ages of 14 and 16, of good character, and the daughter of a serving railwayman who is a member of a recognised railway trade union. Selection is made from photographs of all nominees. The qualifications of each applicant accompany her photograph but are covered during selection so that final judging is made only on the photograph itself. All activities are carried out by voluntary workers, and no money is asked for or desired, since it is felt that even well-meant gifts might destroy the Council's independence. This is currently under the Chairmanship of Mr. J. E. Lawton, of the Engineering Department at Huddersfield, and of the Vice-Chairmanship of Councillor A. Parker, Area Welfare Officer at Hull. The Treasurer is Mr. A. Blunn, a Guard at Manchester, and Members of the Council are Mr. G. Cullup, an Engine Driver at Peterborough; Mr. T. C. Roberts, a Station Inspector, Llandudno Junction; Mr. G. H. Reynolds, a Guard at Exeter; Mr. J. Lee, a Signalman at Honley, and Mr. W. A. Shaw, a Goods Foreman at Waterloo Docks, Liverpool. The General Secretary is Mr. W. H. Ferran, an Engine Driver at Ardwick. Mr. Ferran, who is the second holder of this office, succeeded the late Mr. Harry Neilson, a shunter, when the latter died in 1953, and is a Founder Member and Past Chairman of the organisation.

Acute Slump in Railway Freight Traffic

(By a correspondent)

UNTIL 1957, British Railways always originated over 20 million tons of freight train traffic in the last four-week period of each year, despite the upset to normal business caused by the Christmas season. Last December, tonnage varied from 20,543,000 tons in 1950 to a peak of 22,420,000 tons in 1953. Last December tonnage was only 19,905,000, a decrease of 1,262,000 tons from 1956, or 6 per cent, and 2,515,000 tons, or 11 per cent, below the 1953 record. Compared with 1956 there was a serious fall in all classes of traffic. Merchandise (including livestock) accounted for the loss of 493,000 tons, or 17 per cent; minerals were down 335,000 tons, or 6·8 per cent, and 434,000 fewer tons of coal and coke were declared, a decrease of 3·4 per cent. Set against 1953 figures the reductions were 976,000 tons of merchandise (25 per cent), 391,000 tons of minerals (7·8 per cent) and 1,148,000 tons of coal and coke (over 8 per cent).

The erosion of freight traffic volume began in September and becomes more devastating with the lapse of time. In 16 weeks to December 29, our railways originated 3,982,000 fewer tons, an amount equal to 4·5 per cent of 1956 forwardings. The advance statement of traffic receipts for four weeks to January 26 shows freight traffic as producing 11 per cent less revenue than in 1957, so that the advent of a new year was far from modifying the downward trend.

It is odd that the U.S.A. railway position is similar in many respects; but across the Atlantic circumstances differ widely from conditions here. A recession of at least 5 per cent in American industrial activity took place towards the close of 1957, and may continue until the middle of 1958. Recently the great steel plants in the United States worked at little above half capacity and the manufacturers of motor vehicles have not been increasing production. Some other industries are slack and 4,000,000 people are reported to be unemployed. For the first time since 1939 the number of railway employees was less than 1,000,000; one estimate puts the reduction in staff at 56,200, or 5 per cent, below the 1956 total. In contrast, our steel industry set up fresh records for output, month after month. General industry maintained production and employment was never better. The aggregate volume of transport must have been larger than ever before in peacetime, but our railways failed to secure an adequate share of the total movement.

Operating Statistics

No. 13 of *Transport Statistics* gives certain operating statistics for 52 weeks to December 29, which will not differ widely from figures for the year 1957. Over that period the loss in tonnage was 2,369,000 tons, or 0·9 per cent, while 561,909,000 fewer ton-miles were worked, a decrease of 2·6 per cent. The faster rate of decline in ton-miles was due in part to the shortening of the average haul for all classes of traffic by roughly a mile and a third to about 71 miles. Wagon loadings numbered 30,736,000, about 755,000, or 2·4 per cent, below 1956. The average wagon load at starting point was 9·55 tons against 9·39 tons a year earlier. The improved loading was confined to minerals and coal, the mechandise load being little more than 4 tons for the whole system and only 3·79 tons for the 3,435,000 wagons forwarded in the London Midland Region.

The all-line train load of 154 tons was nearly 5 tons lower, the Regions recording decreases varying from 2 tons in Scotland to 6·5 tons in the North Eastern. Freight trains ran 134,507,000 miles, an increase of 462,000, or 0·3 per cent. The whole of the additional mileage was run in the first 36 weeks of the year. In December freight train-miles were about 2·4 per cent below the 1956 level.

Over 52 weeks in 1957 freight train-hours were reduced by 293,000, or 2 per cent, to 14,550,000. The speed of steam freight trains rose from 9·05 miles an hour to 9·27, but the speed of electric freight trains slowed from 10 miles an hour to 9·87. Diesel freight trains made slow progress at just over 4 m.p.h. and covered only 103,000 miles.

The output of freight train operation receded to 1,173 net ton-miles per engine-hour, 10 points below the 1956 figure. Though the London Midland Region produced 13 more ton-miles in a train engine-hour, its output of 1,186 remained well below the Eastern figure of 1,398 and the North Eastern figure of 1,263, but was 116 units, or nearly 11 per cent, above the poor return from the Western. The Eastern Region also set the pace in moving wagons in a train engine-hour. Though its statistics at 249 was 5 points below 1956, it was 27 points above the all-line average of 222, 17 points in front of the North Eastern and 50 ahead of the Western.

This brief analysis of operating results brings out the adverse effect of the decline in traffic volume on statistics based on ton-miles and wagon-miles.

Railway Rolling Stock

At December 29, 1957, British Railways owned 16,928 steam locomotives, 339 of which were stored and 2,618, or 15·4 per cent, were under repair. The ownership of diesels of all types was 802 against 606 in 1956. The number under repair was 90, or over 11 per cent, compared with 63, or 10·3 per cent, in 1956, when the under-repair percentage for a stock of 453 diesel multiple-unit passenger carriages was the same. At the close of 1957 the stock of these carriages was nearly three times as large and 114, or 8·4 per cent, were unserviceable. For a fleet of new vehicles the number out of action was excessive, though the percentage under repair was reduced from 9·7 at March 24.

At the end of December the stock of railway freight vehicles was 1,104,890, a reduction of 12,570, or 1·1 per cent, during last year. The number under repair was 63,390, or 5·7 per cent of stock, compared with 60,570, or 5·4 per cent of stock, in December, 1956. The railways thus began the present year with some 15,000 fewer wagons available than they had on January 1, 1957. It would, however, be interesting to know the average daily surplus of wagons in recent weeks. On the U.S.A. railways the surplus has been at times as large as 100,000.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Suburban Rolling Stock

February 8

SIR,—Mr. John Rodgers, in his letter in your February 7 issue, asserts that, by re-arranging the seating in Southern Region suburban electric stock in bus style, there would be a gain in comfort and standing room in return for a loss of only 28 seats.

Such re-arrangement would mean that three out of every five seated passengers could not leave their seats without others having to rise and move into the gangway; the number of passengers boarding or alighting at any one time would be reduced from ten to six; many standing passengers would have nothing to hold on to unless the ceilings were liberally hung with straps (which are not really suitable for standard-size coaches); and the possible number of standing passengers in the equivalent of a 10-bay open coach would be reduced from 78 to about 64. These figures allow the same amount of space per "standee" and are based on the unlikely assumption that passengers would abandon their deep reluctance to "pass along the car," and in so doing make it virtually impossible for anyone in a window seat to alight before the doors closed and the train re-started.

Yours faithfully,

L. A. MACK

13, Upper Grotto Road, Twickenham

February 9

SIR,—I refer to my letter published in your January 17 issue. Perhaps I should have asked what stock, *with the same number* of guard-controlled sliding doors, can seat 958 passenger in 10 cars.

Mr. Rodgers' idea, expressed in his letter in your issue of February 7, would only provide two 4-ft. clear opening doors, which would cause delays at stations. Even with the number of doors at present provided, delays sometimes occur in unloading and loading passengers, including those who have to get out to allow others to alight. There would be a tendency for passengers to stand around the doors; that is only natural, a passenger going from one station to the next—(there is considerable traffic in the Southern Region between Waterloo and London Bridge)—does not want to have to battle his way out from the end of the coach. I do not know whether the Eastern Region suffers from severe overcrowding as does the Eastern Section of the Southern Region, or, if it does, how the problem is overcome; but it is significant that the stock provided for the Eastern Region extension to Southend has the normal type of door.

Passengers would not take kindly to the type of seating suggested by Mr. Rodgers, and there would be difficulty in siting the luggage racks; these at present are over the seats, and accessible to all, besides providing something for standing passengers to hold on to.

Yours faithfully,

J. E. LAKE

Aloha, Wiston Avenue, Worthing

A.C. Traction Motors

February 11

SIR,—Mr. Herbert Charnley, in his letter in your February 7 issue, wonders why no one appears to be taking any interest in the a.c. traction motor for railways electrified on the 50 cycles single-phase system.

It may be true, as he asserts, that the a.c. motor can be lighter than the d.c. for a given horsepower; but it is often not so for a given service, as h.p. and service capability are related only indirectly. The French National Railways, both in their initial experiments in 50-cycle electrification in Savoy and subsequently on their electrification in the North-East, ordered some locomotives with straight a.c. motors. Their horsepower is as great as that of the rectifier locomotives, but performance is so markedly inferior that the S.N.C.F. is to concentrate on rectifier locomotives in future. No a.c. motor can withstand stalling or heavy overloading combined with very low rates of acceleration such as occurs when starting 2,000-ton trains on gradients with quite small Bo-Bo locomotives—a routine matter now in France.

The S.N.C.F. is leading the way in industrial frequency traction. Until we in Britain have much more experience ourselves, we cannot do better than follow French practice. Later, perhaps, a time may come for bold experiments with a.c. motors, but let us first have a respectable mileage of electric traction with proved equipment.

Yours faithfully,

G. H. HAFTER

49, Church Street, Isleworth, Middlesex

The Setback to U.S.A. Railroads

February 13

SIR,—On January 21 the Association of American Railroads issued a bulletin on the U.S.A. transport situation which defines the extent of last year's setback to the prosperity of the railway industry. Revenue wagon loadings, numbering 35,500,000, were 2,345,000 or 6·2 per cent, below 1956 and 2,136,000, or 5·7 per cent, below 1955, but were 1,585,000, or 4·6 per cent, above 1954. Ore was the only commodity to be forwarded in larger bulk; loadings were 113,000 more than in 1956, or 4·1 per cent. Lake ore tonnage of 84·6 million tons was nearly 1 per cent over 1956, while ore was imported through ocean ports for rail carriage to the amount of 20,300,000 tons, representing an increase of 3·7 million tons on 1956, or nearly 23 per cent.

Last year's coal output in the United States was 10·8 million tons, or 2·2 per cent, below 1956. Railway wagon loadings numbered 6,749,620, a decrease of 257,470, or 3.7 per cent, from 1956; but an increase of 241,320 on 1955—again a difference of 3·7 per cent. The overseas export of coal from U.S.A. ports reached an all-time record of 60·5 million tons, exceeding the 1956 export by 9·4 million tons, or 18·5 per cent. In the Pocahontas Region, the Chesapeake & Ohio, Norfolk & Western, and Virginian Railroads, which convey coal to tidewater, profit by the failure of our National Coal Board to produce more coal; and they have extended their facilities on the assumption that they will handle a growing tonnage over a long term of years. When coal and coke are excluded, the volume of export and coastal freight through the ports declined by 5,530 wagonloads, or 3 per cent, in the whole year 1957; in the month of December alone there was a decrease of 31,500 wagonloads or 28 per cent.

The railroads began this year with a stock of 1,656,800 wagons available for traffic, more than at any time since May, 1954. During 1957 they placed 92,590 new wagons in service and retired 54,360. At the end of the year 89,890 wagons, or 5·1 per cent of ownership, were under repair; at the close of 1956 the under repair percentage had been reduced to four. During 1957 the railroads installed 1,312 new and retired 182 old diesel units, so that they began 1958 with a stock of 27,345 diesels, of which 1,038, or 3·7 per cent, were under repair. They also owned 587 electric units, with 67, or 11 per cent, under repair, and 2,344 steam locomotives, of which 503 were out of action. The diesel fleet of 26,307 serviceable units represented fully 91 per cent of the total number of locomotives available for traffic and was responsible for the same proportion of freight, passenger, and yard service.

Yours faithfully,

R. BELL

Frognal, N.W.3

THE SCRAP HEAP

Where's That Tiger ?

The following telegraph message was received by a controller from an up-country station in India: "Down mail at home signal. Tiger on platform. Stationmaster on roof. Please advise."

The Model-Maker

A lifelong passion for railways, and an apprenticeship in that branch of precision engineering where measurements must be accurate to the 1,000th part of an inch, had made him one of the two or three foremost builders of model railway engines in the country... He had just finished an order for two Caledonian four-coupled engines of a class long since extinct. They were standing there on his work bench, perhaps 6 in. in height, an exactly beautiful job, and finished in that shade of royal blue which the old Caledonian always affected, together with a tiny crest. . . . Someone else had ordered an old Great Northern 0-6-0 freight engine, the first class of engine Sir Nigel Gresley designed when he went to Doncaster; and that was about half-done.

For some extraordinary reason, which he could not begin to fathom, the Southern engines stirred no fans at all. . . . It was sadder still, he thought, that never, never would he be asked to build a model of the last of all the notable steam engine designs, the "Britannias." But she and her sisters had the fatal label "nationalised" tied round their chimneys, and that was altogether too much for the rigid conservatism of the fans.—*From "The Times."*

Cuckoo in the Nest ?

A steam locomotive is to be built by the electrical engineering firm of Lancashire Dynamo & Crypto Limited. This does not mean a resurgence of steam motive power for main-line railways, however, as the engine is a $\frac{3}{4}$-in. scale model. It is to be built by apprentices of the company at the Trafford Park Apprenticeship Training School, to add interest and variety to the teaching of basic machining techniques. While it might appear unusual for apprentices employed by an electrical manufacturing group to be engaged in machining the parts for a model steam locomotive, the experiment is stated to be successful in capturing the interest and imagination of the students. The apprentices will machine more than 500 components in constructing the locomotive. These range from brass pegs of $\frac{1}{16}$-in. dia., to the driving wheels, and the mechanical lubricator.

The model is a $3\frac{1}{2}$-in. gauge 0-6-0 tank locomotive built to drawing supplied by Bassett-Lowke Limited, of Northampton; it is 29 in. long over buffers. Boiler pressure is 100 per sq. in. A load of 16 adult passengers can be hauled. It is the intention of the company to run the engine, which has been named *Johnnie*, on a track at the social club at Sale.

Rate War in North America (1898)

The Canadian Pacific Railway having decided upon measures to meet the cutting of rates by the American transcontinental lines, a great passenger rate war has now commenced. The American lines started by cutting on the Klondyke rates, and this action has been met by a considerable reduction in the rates of the Canadian Pacific. Tickets will be issued from tomorrow from Montreal to points on the Pacific coast at the price of $40 for first class and $30 for second class, the old rate being $70 and $60 respectively.—*From "The Financial Times" of February* 19, 1898.

Leicester & Swannington Memories

The old Leicester-Swannington railway has been closed for many years, but memories of it were revived at a meeting of Leicester Highways Committee. Three new roads, part of the Pindar Road development plan at New Parks are near the railway and it was decided to name them after engines known to have been running for the railway company—Comet Close, Samson Road, and Phoenix Close.—*From the "Leicester Mercury."*

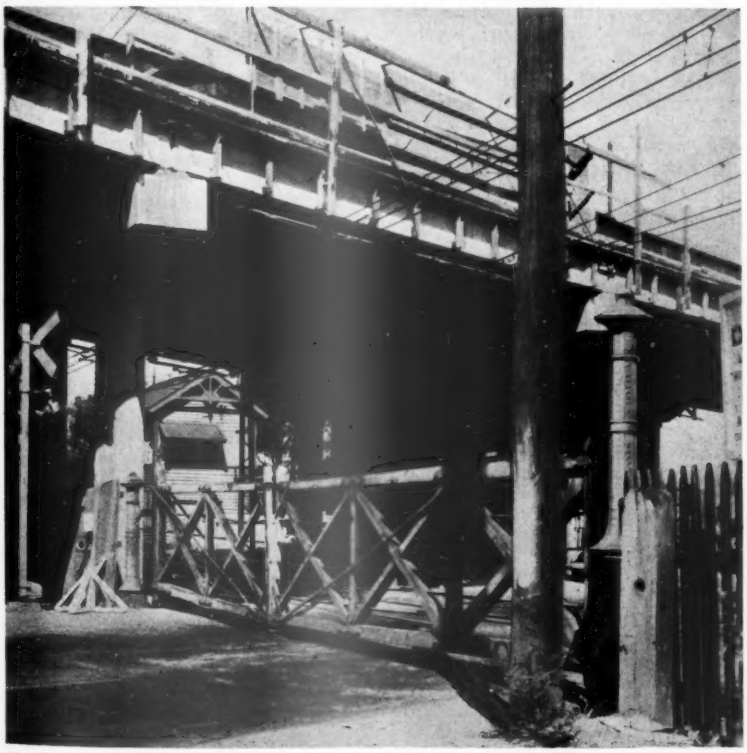
[Most of the Leicester & Swannington Railway, the original component of the Midland Railway, is still open for freight traffic—Ed., *R.G.*]

Robbing the Thames

I was always told that the spring at Thames Head (Trewsbury Mead) ceased to flow regularly when the Great Western Railway made their pumping station to supply the pick-up water troughs near Kemble, for this tapped the spring at Thames Head. Perhaps when the ugly diesel-electric locomotives displace the beautiful steam engines the water troughs may become redundant and the spring flow constantly again. In this case, if I live to see it, I might even like the diesel-electrics.—*Sir Jocelyn Bray, Chairman of the Thames Conservancy Board, in "Country Life."*

[Sir Jocelyn Bray presumably was referring to the locomotive water main which leads down to Kemble; there are no troughs on the Swindon-Kemble-Stroud-Gloucester line.—Ed., *R.G.*]

Gates Closed for the Last Time



Photo] *[Guy Bakewell*

The new bridge over the Victorian Railways line at Clifton Hill, near Melbourne, one of several new bridges replacing level crossings over busy suburban electrified lines

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

EAST AFRICA

Passenger Traffic in 1957

Passenger journeys over E.A.R. & H. rose from 5,828,000 in 1956 to 6,395,000 in 1957—an increase of 567,000, or approximately 10 per cent. First-class passengers at 76,000, numbered 2,000 more than in the previous year, and second-class at 193,000, more than 1,000. Nearly all the increase was derived from third-class travel; the number of third class journeys increased by 564,000 to 6,126,000.

This rise was caused mainly by the easing of movement restrictions on certain tribes in Kenya, and also by the improvements in services and facilities made during the year.

Changamwe Industrial Area

By the end of this month the present phase of planned development of the East African Railways & Harbours Administration industrial area at Changamwe, some three miles from Mombasa, will be ready for general occupation. Road and rail access will, by that time, be completed and all essential services ready for tapping. This phase of the project comprises four industrial blocks, each 2,500 ft. in length and varying in width from 160 ft. to 400 ft. The current scheme covers roughly a quarter of the area reserved by the E.A.R. & H. for industrial development at Changamwe.

The branch line serving the area enters from the new, diverted main Mombasa-Nairobi line via the Changamwe section, with a common feeder line leading to spurs dividing the industrial blocks. Road access stems from a feeder road on the southern boundary of the area which connects with the main Mombasa-Nairobi road.

Drainage works are in the course of completion, with outfalls connecting with existing municipal mains traversing the Port Reitz area. Storm water delivery is into Port Reitz waters and sewerage to the sewage disposal works at Kipevu.

Two industrial users are already on their sites. Ozo East African Petroleum Co. Ltd. has built a 12-acre terminal which contains six main storage tanks with a capacity of 23,000 tons. Several other firms have applied for sites on the estate.

The Chief Engineer of the E.A.R. & H. is carrying out the development construction of the industrial area. W. C. French Limited have been awarded a contract for a section of the roadwork and the construction of drainage.

RHODESIA

Re-laying and Ballasting

The whole of the 1,246 miles of main line between Umtali in Southern Rhodesia and Ndola in Northern Rhodesia has been relayed with 80-lb. rails. A start was made on the replacement of the old 60-lb. rails between Salisbury and Hunters Road in 1936 and apart from interruptions caused by the war and the postwar steel shortage, work has continued.

The present cost of rails, sleepers and fastenings is £14,300 a mile; which with labour charges makes £15,000.

Apart from the main line, the 42½ miles from Nkana-Kitwe to Chingola in Northern Rhodesia are being laid with 80-lb. rails, as is the 49 miles from Somabula to Bannockburn at the commencement of the new South East Line to Lourenço Marques; 60-lb. rails are being laid with stone ballasting to the standard of 1,400 cu. yd. a mile, on the 24½-mile Kildonan branch.

Signalling at Bulawayo

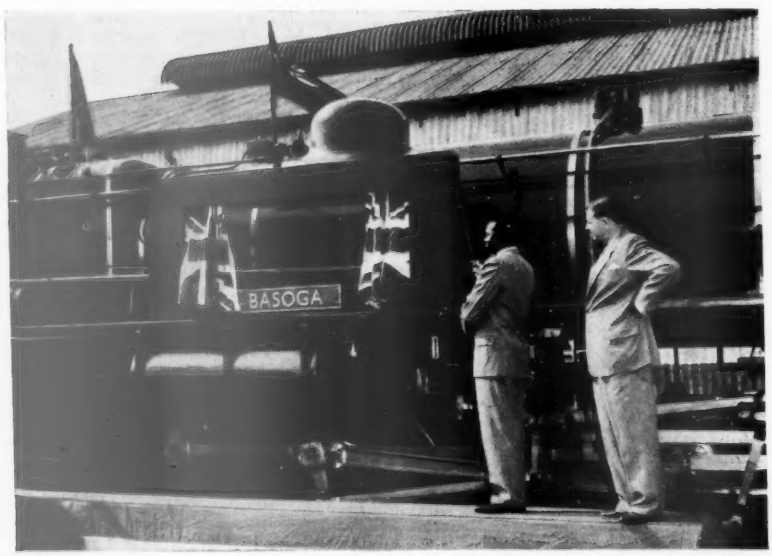
Another phase of the Bulawayo terminal signalling arrangements was completed recently when the scissor cross-over at the east end of Platforms 3 and 4, which was formerly controlled by point tumblers, was converted to power operation, and new position light shunt signals installed.

The point machines are locally operated by the foreman shunter after he has received a release from the Bulawayo cabin.

In connection with the signalling of departing trains from Bulawayo, new platform repeater signals were recently brought into use. They consist of two-aspect colour light signals suspended from the platform roofs, which normally display a white "R" on a black background.

When the platform starter signal is cleared for the train to depart, the repeater signal changes to "green." This gives the guard an indication that the starter is off, as he cannot see it from his position at the rear of the train due to the curvature at the far end of the platforms.

Vulcan Locomotives in East Africa



Mr. H. W. Muloki, Kyabazinga of the Basoga tribe, naming the "Tribal" class 2–8–4 locomotive "Basoga", built by the Vulcan Foundry Limited (see last week's issue); on the right is Mr. L. L. Brown, Regional Representative in Uganda of East African Railways & Harbours

INDIA

Moghalsarai Avoiding Line

A new 1¼-mile line to facilitate running of through freight trains between Allahabad and Lucknow was opened to traffic recently at Moghalsarai by Mr. S. Sarangapany, General Manager of the Eastern Railway. Moghalsarai yard is the junction point of the Eastern and North Railways' broad-gauge systems. Four different routes of the two railways converge there; construction of the new line, completed within a period of three-and-a-half months, marked the conclusion of the first phase of a remodelling plan of the marshalling yard, which can now be by-passed by the through Allahabad-Lucknow traffic.

Inauguration of N.F.R.

The Governor of Assam, Syed Fazl Ali, presided at the recent inauguration by Mr. Jagjivan Ram, Federal Minister

for Railways, of the North-East Frontier Railway (N.F.R.), which is formed from the eastern portion of the North Eastern Railway.

The division between the N.F.R. and the residual N.E.R. is at present at Katihar, in North Bengal. Later when the marshalling and interchange yards now under construction at Barauni, in Bihar, are completed, the boundary will be moved westwards to Barauni. The connected branch lines Thana Bihpur-Bhagalpur; Mansi-Supaul; Saharsa-Purnea; Behariganj-Banmankhi; and the Sahebpur Kamal-Monghyr Ghat Sections will also be transferred from the N.E.R. to the N.F.R. Editorial reference to these matters was made in our issue of November 8, 1957.

Northern Railway Workshops

During the Second Five-Year Plan period, a signal workshop is to be constructed at Ghaziabad and a bridge workshop near Allahabad, on the Northern Railway. Also during this period, the following four works of the Northern Railway are proposed for expansion: locomotive workshops at Amritsar and Bikaner, carriage and wagon shop at Jagadhri, and a bridge workshop at Jullundur Cantonment. The remodelling of the locomotive, carriage and wagon shop at Lucknow is at present in progress.

ISRAEL

New Stations and Depots

On completion of the new line between Tel Aviv North and Tel Aviv Town, the Tel Aviv Central station was opened recently to traffic. New stations also have been built at Netanya, Ramla, Beersheba, and several are under construction on the Haifa-Tel Aviv line. New depots have been constructed adjoining the workshops near Haifa, also a diesel locomotive shed.

UNITED STATES

The Reading "Crusader"

In 1937 the Reading Railroad introduced a streamline train of stainless steel stock between Philadelphia and Jersey City, making two double journeys daily over the 90-mile route. At first hauled by Pacific locomotives specially streamlined to match the coaches, it has since been turned over to diesel haulage.

Rapid acceleration is involved; on the first morning working, at 6 a.m. from Philadelphia, for example, the 79·5 miles from Jenkintown to Jersey City are run in 80 min. with three intermediate stops.

In 20 years the "Crusader" has run approximately 2,000,000 miles and carried about 3,500,000 passengers; except during periods of overhaul, it has never missed a scheduled journey.

ARGENTINA

State of Railway Track

The State Railways have published a statement according to which, of the 45,000 km. of track, 12,200 are in bad condition; 15,600 in medium condition; 15,900 in good condition; and only 1,300 km. in very good condition. Only 1,800 km. have been renewed over the past 10 years; 5,000 km. are more than 50 years and 20,200 more than 45 years old. Maximum speeds allowed are: 16,800 km., 40/60 km.p.h.; 19,800 km., 60/80 km.p.h.; 6,500 km., 80/100 km.p.h.; and 2,300 km., more than 100 km.p.h.; 17 per cent of the track is stone-ballasted, and 60 per cent rests directly on the earth. More than 50 per cent of sleepers are more than 30 years old; 75,000 tons of rails are urgently needed, and at least 2,400,000 sleepers and 2,400,000 cubic metres of stone ballast are required.

FRANCE

Signalling on Lyons-St. Etienne Line

At Givors on the Lyons-St. Etienne line, now in course of electrification, the S.N.C.F. has built an electric all-relay signalbox with route-setting buttons, which replaces three existing boxes at this station and also two boxes at Givors-Canal station. This was brought into operation last November, at the time of the inauguration of automatic block colour-light signalling between Chasse and St. Romain-en-Gier. Subsequently, in December, two new Saxby mechanical boxes were brought into use at Badan, whilst at Oullins one Saxby box has replaced two existing boxes.

NETHERLANDS

Further Electrification

Electrification of the section from Alkmaar to Den Helder, now in progress, is expected to be completed in time for the introduction of the 1958 summer timetable.

Publications Received

North-East Frontier Railway.—A brochure issued to mark the inauguration last month of the North-East Frontier Railway (N.F.R.) of India contains messages from the President of India, Dr. Rajendra Prasad, and the Minister for Railways, Mr. Jagjivan Ram. There are brief notes on the area and boundaries of the new railway (formed out of the North Eastern Railways, as described in our issue of November 8, 1957); an historical review with some details of the railways forming the N.E.R. and N.F.R.; topographical notes; an outline of development plans; and a coloured map. The photographic illustrations depict scenes in Assam and North Bengal. The brochure is obtainable from the office of the General Manager, N.F.R., Pandu, Assam, India.

Unusual Railways. By John R. Day and B. G. Wilson. London: Frederick Muller Limited, Ludgate House, 110, Fleet Street, E.C.4. 8¾ in. × 5½ in. × 1 in. 212 pp. Illustrated. Price 21s.—The variety of the contents of this book will surprise many. The scope is indicated by the headings to the chapters: ship railways; rack and similar systems; cable-worked railways; funiculars; atmospheric railways; guide-rail systems; pneumatic tyre systems; monorails; overhead railways; concrete tracks; and "some other systems." Many examples cited were (or are) devised as special forms of track or propulsion to meet a particular need, such as to climb gradients beyond the unaided power of an ordinary adhesion locomotive. Others were intended to reduce cost of construction and operation, or to achieve very high speed. At the other end of the scale, there are the arrangements (some built, but others only paper schemes) in which the ingenuity of inventors seems to have been inspired more by novelty than by commercial considerations.

Holidays in the U.S.A. and Canada.—Rail travel is included in several of the inclusive tours in the U.S.A. and Canada, arranged for the coming holiday season by Thos. Cook & Son Limited and Dean & Dawson Limited. The catalogue issued by these firms lists some holidays at what appear to be remarkably low prices for the value given. A 32-day holiday from Southampton back to port at 232 guineas includes tourist sea travel, and "coach" class railway travel by day and first class with sleeping accommodation a night journey from Buffalo to Washington; this tour covers Montreal, Toronto, Niagara Falls, Buffalo, Washington, Philadelphia, and New York. A 17-day tour at £121 7s. from New York to San Francisco includes first class railway travel to Philadelphia, Washington, Chicago, the Grand Canyon, and Los Angeles. Holidays confined to the Eastern parts of the U.S.A. and Canada are priced accordingly.

Cook's Continental Timetable.—The March issue includes a new section giving, in advance, summer timings of the named Continental expresses. A supplement gives a summary of the train services applicable during the summer on the main routes from and to the Channel ports. A few timings are still provisional, and any necessary alterations will be incorporated in each succeeding edition as it appears. The enlarged timetable will be on sale at the offices of Thos. Cook & Son Ltd., from March 1, price 8s. 6d.

Railbuses for British Railways

Four-wheel 150-h.p. vehicle with rubber suspension and other light-weight features

THE first of a number of railbuses ordered by British Railways for tests on selected services in rural areas has been delivered. The vehicle, one of five being constructed by A.C. Cars Limited, of Thames Ditton, Surrey, to the requirements of the British Transport Commission, was on view at Marylebone last Thursday. It is a four-wheel vehicle of light-weight construction with a tare weight of some 11 ton. It has seating accommodation for 46 passengers in two saloons; it is powered by an under-floor 150-h.p. B.U.T. "A"-type diesel engine and is designed for a top speed of around 55 m.p.h.

Leading particulars of the railbus are as follow:—

	ft.	in.
Length over buffers	37	0
Length over body	36	0
Width over panels	8	11
Overall height from rail (laden)	12	2¼
Inside width at waist rail	8	6
Floor height from rail (laden)	4	3
Interior height, floor to ceiling	7	4
Wheelbase	19	0
Wheel diameter	3	0
Tare weight, approximate	11	tons

Constructional features of the railbus include the use of rubber suspension for axlebox/underframe and underframe/body mountings, the use of B.U.T. power transmission equipment, many components of which are interchangeable with those on British Railways standard railcars, power-operated sliding doors, and an absence of normal sidebuffers or drawgear.

Other railbuses, of different design, are being built by Bristol Commercial Vehicles Limited (2), Park Royal Vehicles Limited (5), D. Wickham & Co. Ltd. (5), and Waggon und Maschinenbau, G.m.b.H. (5).

The underframe is designed as a light-weight steel unit, principally of mild steel channel section electrically welded together. The two axles are carried in SKF self-aligning roller bearings in cast steel axle boxes. Wheels are of the light rolled steel disc type.

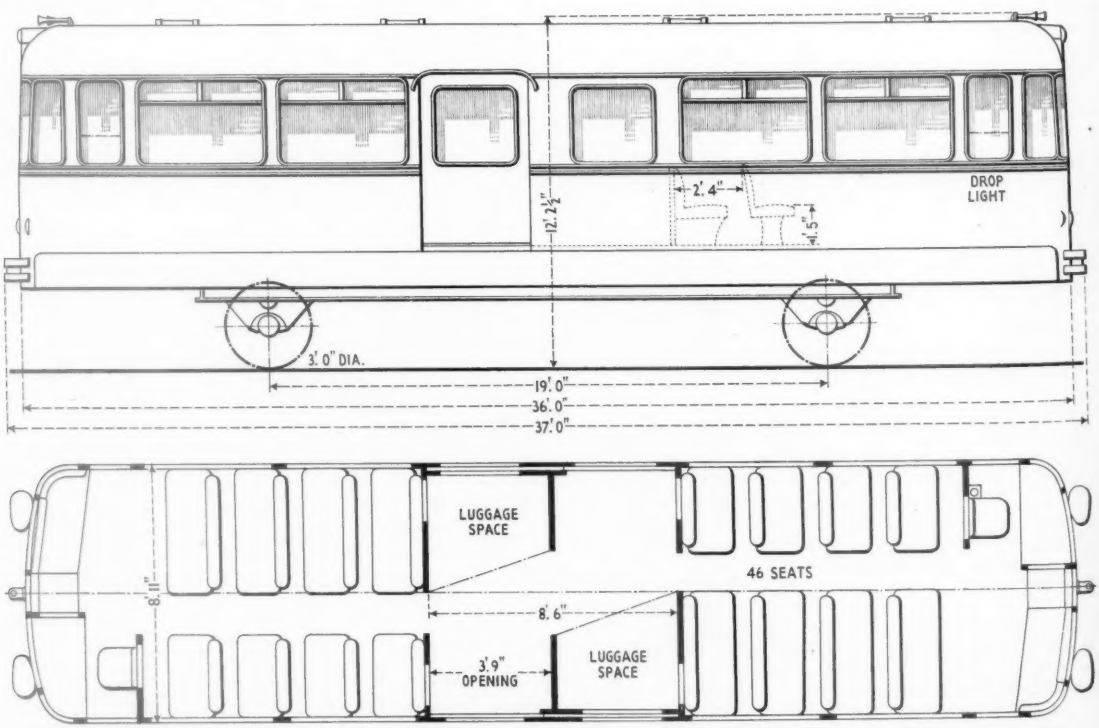
Springing between the axle box and the underframe is by means of Metalastik chevron rubber shear-compression units. Each axle box carries two units mounted at an angle relative to each other; this angle determining the ratio of shear to compression.

The underframe also carries four Metalastik bonded-rubber mountings, focused upwards and inwards towards the centre of gravity to suspend the body shell. These are located at each corner of the underframe. For vertical and transverse loads they are in shear and compression; longitudinally they are largely in compression. Hydraulic dampers are also fitted to prevent undue oscillation.

Power is derived from a British United Traction Limited "A"-type 150-h.p. six-cylinder horizontal diesel engine; this drives through a fluid flywheel, and thence through a free wheel unit to a four-speed epicyclic gearbox. A universal joint shaft takes the drive to the final drive unit mounted centrally on one of the axles. Torque reaction is taken by an arm incorporating rubber buffers attached to the underframe. The final drive unit also incorporates the forward and reverse gears. Electro-pneumatic control equipment is also of B.U.T. manufacture. Combustion air for the engine is taken through a large air filter and thence to the manifold by flexible pipe. The engine cooling water radiator is mounted at the side of the underframe.

A 50-gal. fuel tank is suspended at one end of the underframe, the filler being located so as to be accessible from rail level. A compressor of 15 cu. ft. per min. capacity is driven through vee-belts from the input end of the gearbox. Air is drawn through a filter and anti-freezer and connections to and from the compressor are flexible to allow for belt adjustment and vibration. Brakes of normal clasp type are employed, operated by a straight-air system.

The generator and control panel is of J. Stone manufacture. The generator



General arrangement and layout of British Railways 150-h.p. railbus built by A.C. Cars Limited

is also driven from the input end of the gearbox; in this position, it is unaffected when the car is coasting by means of the free wheel.

Batteries fitted to the railbus are 200-A-hr. Nife alkaline type, suspended at the side of the underframe. Some protection is afforded by a wooden battery box with a hinged side to allow for battery servicing. Heating is by means of a Smith combustion unit operating on diesel engine fuel. It is mounted on the underframe, fresh air being drawn through a filter before heating and then ducted to a number of points beneath the seats.

Because with this type of railbus design drawgear and buffers cannot be mounted directly to the underframe, they are carried by the body sub-frame. They are not designed to withstand normal usage and shunting stresses, but are fitted as a means of towing the railbus in the event of a failure whilst on the track, for which they are adequate.

Lightweight railbus, showing part of underfloor equipment and special buffers

Body Construction

The car body is a light steel shell fabricated by welding from top hat, channel, and Z sections. The floor consists of a corrugated steel section attached by welding to the body longitudes and cross members. It is covered by a wood composition floor and linoleum. Exterior panelling is of 16 s.w.g. aluminium for the sides and ends and 18 s.w.g. aluminium for the roof panels. Generally, the panels are riveted to the framework and panel joints covered with a moulding of suitable section. Electrolytic action between the aluminium panels and steel frame is prevented by a jointing medium. Ceiling panels, also of aluminium, are 20 s.w.g. except for the end domes which are formed from 18 s.w.g. Where necessary the panels are treated with sound-absorbing material to prevent drumming.

A single air-operated sliding door is fitted at the middle of each side of the body. The doors are arranged to slide into pockets formed in the vestibule sides. The vestibule is divided from the saloons by partitions; these are panelled to waist height and provided with glazed portions above.

Release cocks are fitted adjacent to each door both on the inside and outside of the car for use in an emergency, or for entry of depot staff.

Side windows are of Beclawat Zephyr type, consisting of a lower portion of $\frac{3}{16}$-in. toughened plate glass surmounted by a light alloy-framed sliding glass ventilator. The whole unit is glazed directly into the body framing by means of Claytonrite self-sealing weatherstrip. End windows consist of a small central one flanked by two larger ones; those at the corners are curved to conform to the body contours. All these end windows are of $\frac{1}{4}$-in. laminated safety glass.

Luggage racks are fitted along each side of the car terminating at the central vestibule. They are of light alloy construction. Lighting is on a 24-V. system. The saloon lighting units are spaced to give good illumination over the whole area of the car, particularly at the doorways. Marker lights and headlamps are fitted according to British Railways requirements.

A driving position is arranged at the left-hand corner of each end of the body. Driving controls generally are similar to those for standard railcars.

Passenger Seating

Seating is arranged in two saloons, one on each side of the centre vestibule. Each saloon is provided with an offset gangway 1-ft. 5-in. wide at seat level increasing to 1-ft. 9-in. above this. The seats are of the fixed type and there are four, two-passenger seats on one side of the gangway, and four, three-passenger seats on the other. The seats in each saloon face towards the ends of the car. Two additional seats, each accommodating three passengers, are situated in the corners of the car at the side of the driving position. Upholstery is of uncut moquette with Vynide panels on Dunlopillo bases.

Ventilation is by means of four extraction-type units mounted longitudinally on the roof of the car.

Sub-contractors included:—

Rubber suspension units	Metalastik Limited
Axleboxes	Skefko Ball Bearing Co. Ltd.
Wheels and axles	Owen & Dyson Limited
Luggage racks and seats	Deans & Son (Yorkshire) Ltd.
Windows	Beckett, Laycock & Watkinson Limited
Heater	S. Smith & Son Ltd.
Warerite panels	Bakelite Limited
Moquette	T. C. Firth (1955) Limited
Saloon lighting equipment and generator	J. Stone & Co. (Deptford) Ltd.
Marker lighting equipment	B.M.A.C. Limited
Power transmission equipment	British United Traction Limited
Battery	Nife Batteries Limited
Sliding door mechanism	G. D. Peters & Co. Ltd.
Air brake and compressor equipment	Clayton Dewandre Co. Ltd.
Windscreen wipers	Trico-Folberth Limited

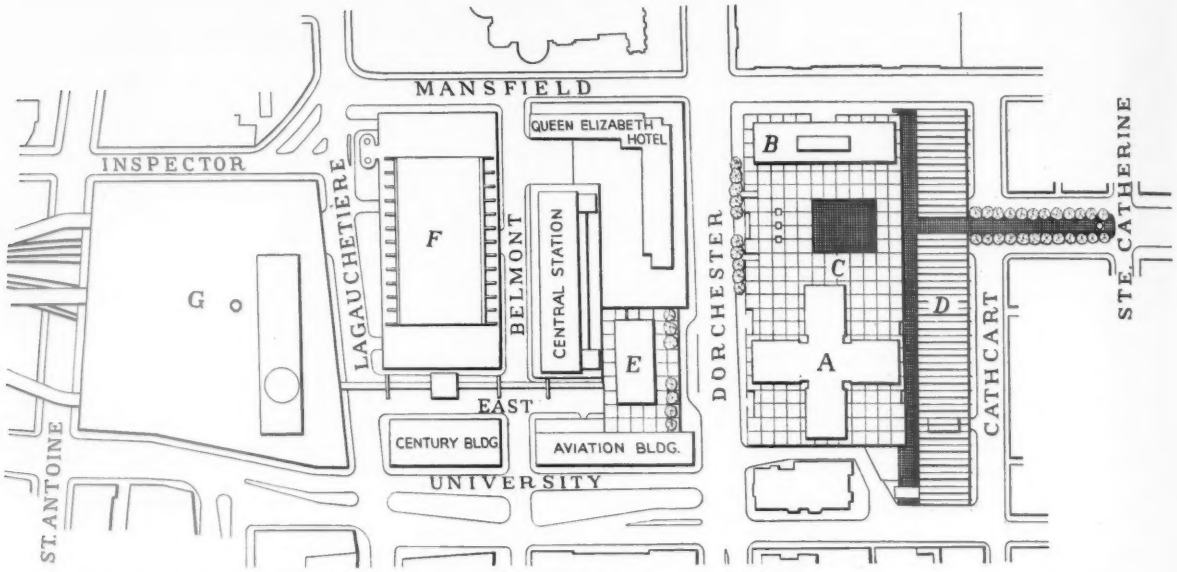
Arrangement of seating, with fixed seats facing away from centre vestibule

Montreal Terminal Developments

Plans for business, transport, and entertainment developments round the C.N.R. Central Station

THE Canadian National Railways board of directors has agreed to surrender 21 acres—three blocks—of railway land round Montreal Central Station, for development as a business, commercial and entertainment centre. The area is bounded by Cathcart, University, St. Antoine, Inspector and Mansfield Streets. One-third of it is to be developed immediately, and completed within five years and known as Place Ville-Marie, the name of the first settlement founded on the site of what is now Montreal.

The most imposing structure in this particular area will be a cruciform metal-and-glass skyscraper, 550 ft. (44 floors) high, designed for offices, the largest and tallest in Canada. There will also be a spacious plaza for pedestrian traffic connected with St. Catherine Street by a tree-lined mall in continuation of a widened McGill College Avenue to provide a vista with Mount Royal as a background. Shops, a square with a theatre and a promenade are also included along the northern side of the plaza. On the Mansfield Street side of it is planned a 15-storey office building, with a sunken open-air restaurant and skating rink between it and the cruciform building. Immediately below the plaza will be a concourse of small shops, arcades, and restaurants and below this again, parking space for 900 motorcars.



A—44-storey cruciform office building
B—15-storey office building facing Mansfield Street
C—Plaza with sunken open-air skating rink and restaurant
D—Shops and theatre with flanking promenade
E—20-storey office building
F—C.N.R. headquarters general offices with parking beneath for 900 cars
G—Transportation centre: heliport at top level, bus terminal and parking space below

Area adjoining the Central Station of the Canadian National Railways, Montreal, showing site under development

C.N.R. Office Building

The other parts of the area will be developed subsequently on similar lines. They will include a large five-storey Canadian National Railways general office building facing Lagauchetiere Street south of the Central Station. Beneath this structure and immediately above the railway tracks will be another three-level park for 900 cars. Facing Dorchester Street another 20-storey block is included in the general plan.

South of Lagauchetiere Street will be the three-level "transportation centre," occupying an entire block, to contain all rail, air, bus, and car facilities in the terminal area. On the roof will be a landing area for helicopters with waiting and restaurant facilities. Below this will be a 52,000-sq. ft. concourse for shops and cars above a bus station and parking space.

A unique feature of the plan is a two-way escalator to handle 7,200 people an hour in each direction, running along the "spine" of the whole terminal area, joining all three blocks, with no danger from street traffic.

The whole scheme is intended to concentrate in the terminal area all facilities for various forms of transport, business, and entertainment.

"FREEDOM OF SCOTLAND" RAILWAY TICKET.—A season ticket named "Freedom of Scotland" is to be introduced from the beginning of April by the British Railways, Scottish Region. It will provide unlimited travel facilities for seven consecutive days anywhere on British Railways in Scotland and on the Clyde Coast and Loch Lomond steamer services of the Caledonian Steam Packet Co. Ltd. The cost is £9 first and £6 second class, with a special concession for families. The tickets will be issued during the period April 1 to October 31. Seats in the observation cars between Glasgow Buchanan Street and Oban and between Fort William and Mallaig, or in the "Queen of Scots" Pullman trains between Edinburgh and Glasgow will be free to the holders; the usual supplements for these will not be charged. First class tickets will be printed on white and second class on green card, with the message "British Railways wish you pleasant journeys during your tour of Scotland."

ROAD TRANSPORT OPERATORS REQUEST REDUCTION OF FUEL TAX.—A deputation from the National Road Transport Federation to Mr. J. E. S. Simon, Financial Secretary to the Treasury, has proposed the abolition of purchase tax on commercial vehicles and a reduction of the fuel tax.

First Main-Line Diesel-Hydraulic Locomotive for British Railways

North British Locomotive Co. Ltd., 2,000-h.p. 117-ton type "4" unit in Western Region

A1A-A1A type "4" diesel-hydraulic locomotive built by North British Locomotive Co. Ltd

THE first diesel-hydraulic main-line locomotive ordered under the British Railways modernisation plan pilot order of locomotives in the autumn of 1955 has been completed (see our November 25, 1955, issue). Intended for service in the Western Region, as are all the main-line diesel-hydraulic locomotives ordered for British Railways, the locomotive underwent a demonstration run this week as recorded on another page.

Leading particulars are:—

Length over buffers	65 ft.
Driving wheel dia.	3 ft. 7 in.
Carrying wheel dia.	3 ft. 3½ in.
Bogie wheelbase	15 ft.
Bogie pivot pitch	35 ft.
Weight in working order	117 ton 8 cwt.
Fuel capacity	800 gal.
Water capacity	1,000 gal.
Max. speed	90 m.p.h.
Maximum tractive effort (30 per cent. adh.) and continuous rating	50,000 lb.

The power rating is 2,000-h.p. and the wheel arrangement A1A-A1A; the British Railways classification is type "4," that for locomotives between 2,000-2,500 h.p. This is the first of five such units being built by the North British Locomotive Co. Ltd.; it incorporates two N.B.L./M.A.N. pressure-charged 12-cylinder diesel engines each set to 1,100 h.p. Each drives the two outer axles of one bogie via a Voith-North British type L306r hydraulic transmission.

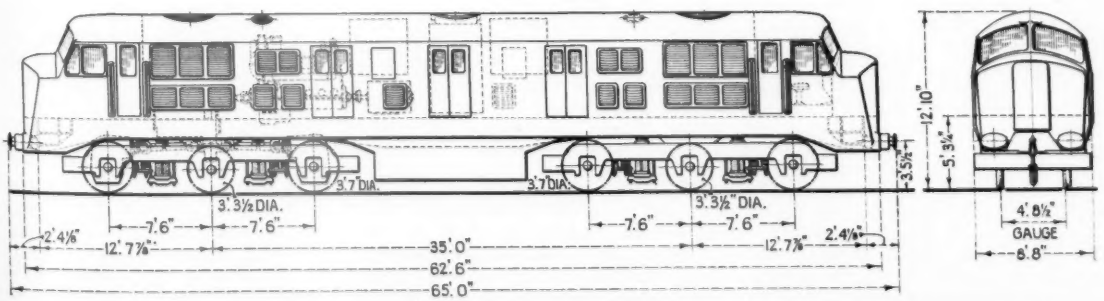
The main frame of the locomotive is constructed from mild steel plates and sections; the main longitudinal members are built up to form an I-section and braced by suitable cross-stretchers. Plates and channels complete the framework, on top of which the platform is built to form a continuous floor. Standard side buffers and drawgear are fitted at each end of the locomotive together with connections for carriage warming and vacuum train pipe. Jumper sockets are provided at each end to allow multiple-unit operation and remote control.

The six-wheel bogies are of double-plate design with sub-assemblies which are welded, and stress relieved. Traction, braking and transverse forces are taken by an inner and outer centring ring. The inner part of the ring is attached to the underframe, the outer part is integral with the bolster.

The total weight of the main frame and superstructure is taken by four widely-spaced bearing pads which rest on a double swing-link bolster. The bolster in turn rests on the transverse laminated springs supported from the bogie frames by spring-link planks and swing links. From the bogie frame the load is transferred to the grease-lubricated Timken roller-bearing axleboxes by a system of beams and coil springs. There are manganese steel liners on axlebox and hornface guides.

Engines

The two N.B.L./M.A.N. L12V 18/21S 12-cylinder-type engines are pressure-charged by Napier exhaust-gas turbo-blowers. These engines, which have a bore of 180 mm. (7·087 in.) and stroke of 210 mm. (8·268 in.), are each rated at 1,000 b.h.p. at 1,445 r.p.m. and 1,100 b.h.p. at 1,500 r.p.m. They are mounted on bedplates which are flexibly mounted to the underframe. Connection of the engine shaft to its transmission is through Hardy Spicer cardan shaft. The cylinder banks are at 60 deg. with the cylinders staggered to allow for side-by-side connecting rods on each crank. The wet-type cylinder liners are of cast iron, located in place by individual cast iron cylinder heads, and are free to expand



General arrangement of N.B.L./M.A.N.-engined locomotive with Voith-N.B.L. hydraulic transmission

downwards, being fitted with rubber sealing rings at the lower end. The crankcase is of a fabricated steel construction incorporating seven cast steel bulkheads carrying the main bearing housings. The two cylinder blocks are welded to the main crankcase frame and are constructed from formed steel plates. The banks are joined at the top by a steel platform which carries the monobloc fuel pumps and governor. To relieve the stresses set up in the cylinder blocks, tie bolts are fitted and extended from the top of the blocks into the cast steel bulkheads. The crankshaft is made from an alloy steel forging hardened and ground, the crank webs being drilled to allow an oil flow from the main bearings to the crankpin bearings. Individual cylinder heads are fitted each with two inlet and two exhaust valves, a fuel injector and a pre-combustion chamber.

Interior of cab showing driver's seat and control pedestal on left, and assistant's position

The valves on each bank are operated by a camshaft situated between the two banks, the camshaft being positively driven by a spur-gear wheel. The gear drive to the tandem fuel pumps is taken from the free end of the camshaft. The connecting rods are one-piece forgings of alloy steel with a copper/lead steel-backed bearing at the large end and a phosphor-bronze bush at the small end. Oil is carried from the big end to the small end by a centrally drilled oil hole.

Exhaust manifolds from the engine connect with the Napier pressure charger inlet, and the output from the pressure charger is ducted through the roof. The hydraulic-boosted governor is gear driven from the crankshaft and electro-pneumatic remote control gear gives seven speed steps from idling to full load. Engine lubrication is primed from a pump driven by an electric motor which cuts out when the engine starts as the oil pressure switch closes and operates the dynostarter motor contactor.

Two Voith-North British type L306r hydraulic transmissions are fitted, each connected through a Hardy Spicer cardan shaft to its appropriate diesel engine. The transmission contains three torque converters. Infinitely-variable torque multiplication is inherent in the design of each hydraulic torque converter, but one is designed to be the most efficient at starting and low speeds, the next for intermediate speeds and the third for high speeds. One converter is filled as another is emptied and the change is made without interruption to the transmission of torque to the wheels. (This is the distinctive Voith principle.) Transmission oil is cooled in a heat exchanger where the heat is transferred to the engine cooling water. This method ensures rapid warming up to the best operating temperature and prevents excessive temperature rise even under severe overloads. Reverse gears are built into the transmissions, the direction of change being controlled by electro-pneumatic valves. An incorporated safety device will not allow the driver to reverse the locomotive while it is still in motion.

Final Drive

The drive from each hydraulic transmission to the axle-mounted gearboxes on the outer axles of each bogie is through Hardy Spicer cardan shafts fitted with needle-bearing universal joints. The gearboxes on each bogie have spiral bevel reduction gears and the reaction torque from each gearbox is taken through torque arms and rubber bushes to the bogie frame. Each engine and transmission unit is independent of the other and can be cut out if required.

The dynostarter on each engine is driven directly from the engine crankshaft and when acting as a generator provides a voltage of 110 for supplying the electrical load and charging the battery. This voltage is automatically held within fine limits irrespective of the generator speed. When acting as a starter the starting current is drawn from a 48-cell lead-acid battery of ample capacity.

The radiator cooling fan motor for each engine is controlled by the water outlet temperature from the engine. When the water temperature reaches 180° F. the fan is automatically switched on; engine water temperature is then controlled by Drayton regulator. When the water temperature drops to 170° F. the fan is switched off.

Brake Equipment

A Westinghouse vacuum-controlled straight air brake is fitted; the driver's vacuum brake valve applies the train brake and makes a proportional application of the locomotive air brakes. The air brake handle does not affect the train, but makes a straight air application on the locomotive, or on all locomotives in multiple. In the unoccupied cabs the air brake handle is in the "release" position and the vacuum brake handle in the "running" position. When hauling an unbraked or partially-braked train the brake application on the locomotive must be controlled by the three-chamber reservoir unit. The operation of the vacuum emergency valve must be delayed until that application is completed. This is accomplished by introducing into the supply pipe to the vacuum emergency valve a "train braked" changeover cock and a timing reservoir.

A flyhandle on the driver's air brake cuts out the proportional application and allows the locomotive to be moved even if the train pipe vacuum is broken. There are four brake cylinders on each bogie, operating clasp brakes on each wheel. Slack adjusters are provided to take up slackness due to brake wear. The exhausters and compressor are each electrically-driven from individual motors.

A deadman's pedal is provided in each cab and when released after a time delay, the locomotive brakes are applied and the engine reduced to idling. A deadman's pushbutton is provided for manœuvring purposes. Compressed air is also used in the control system, sanding and operation of windscreen wipers.

The internal lighting is all at 110 V. and may be connected to an external supply of 230 V. a.c. through a changeover switch and a step-down transformer. The marker lights work on a supply of 24 V.

Driving Controls

The controls are grouped together in each cab. At the first step of the power handle the engine idles but no power is transmitted since the filling valve of each transmission is in the closed position, allowing no oil to the first torque converter. At the next step

the transmission filling valve of each transmission opens and power is transmitted to the wheels. The remaining steps give progressively greater engine speeds and greater power to the wheels up to the maximum. When the master reversing handle is at the "off" position in the driving and driverless cab, all controls are dead. This master handle is locked in the "off" position when the master key is removed. In this way unoccupied cabs are made safe in multiple working. Interlocks prevent incorrect operation of the reverse gears and the application of power unless the gears in all transmissions are home in the correct direction.

Gauges, instruments, light switches and warning lights are grouped in each cab. Separate start and stop buttons allow either engine to be cut in or out at will. Automatic safeguards protect the engines and transmissions against excessive oil temperatures, and the engines against loss of oil pressure, loss of water or excessive overspeed.

Warning Lights

Safety features include warning lights provided at each engine position and a general warning light which shows the driver if a fault has developed. Remote-reading tachometers indicate to the driver the engine speeds of any engine, even when in multiple. On the control pedestal, lights indicate the functioning of the reverse gears. Failure of air pressure or vacuum prevents the engine being used to drive the locomotive. When in multiple the control between the locomotives is through jumper cables, air and vacuum hoses. Automatic train control apparatus is fitted.

The Spanner boiler is situated at the centre of the locomotive and is automatic after the initial lighting up. The boiler working pressure is 80 lb. per sq. in. and the water level of the boiler is maintained by a regulator at the correct working level.

Sub-contractors for these locomotives include:—

Pressure chargers ..	D. Napier & Son Ltd.
Fuel injection equipment	C.A.V. Limited.
Final drives	David Brown & Sons (Huddersfield) Ltd.
Dynostarters and exhauster motors	Electric Construction Co. Ltd.
Cooling system fan motors	British Thompson-Houston Co. Ltd.
Temperature control equipment	Drayton Regulator & Instrument Co. Ltd.
Brake control equipment, compressors, and exhausters	Westinghouse Brake & Signal Co. Ltd.
Axleboxes	British Timken Limited
Fuel and lubricating oil filters	Vokes Limited.
Fire extinguishers ..	Pyrene Co. Ltd.
Seats	A. W. Chapman Limited

Raising Bridge Under Traffic, Victorian Railways

Fifteen-inch lifts carried out under temporary speed restrictions

BRIEF reference was made in the Overseas columns of our issue of September 6, 1957, to the re-location of the Wodonga-Cudwega branch line, necessitated by the construction of the Hume Dam. This entailed the raising of the Sandy Creek bridge and the addition to it of two 40-ft. spans. The following is a description of the lifting work.

The raising of the 31 60-ft. spans by 8ft. is being carried out without interference with traffic except the imposition of a temporary speed restriction. The lifting is done progressively in lifts of about 15 in.

The ends of the four main girders resting on each pier are raised with two 40-ton hydraulic jacks in the following manner. The jacks are first placed on the pier between the main girders, touching their lower flanges and on the centre-line of the pier. On them is placed a 10-in. × 8-in. steel beam long enough just to clear the girder webs at each end, its ends thus being below the gaps between the top flanges of the girders. Four 6-in. × 3-in. steel struts, in pairs, rest two on each end of the steel beam and slightly splayed apart so that their tops transfer the thrust of the jacks to the underside of the top flanges of the four girders.

Between lifts, each main girder is supported by a seat consisting of five short pieces of scrap rail welded together cribwise. When they take the weight of the four girder-ends the jacks can be removed to the next pier and the first pier is built up round the rail-seats in concrete—reinforced at the pier-ends—to the level of the tops of the rail-seats. The process is thus repeated in stages throughout the length of the bridge until all the piers are raised by 8 ft.

Where a 15-in. lift cannot be carried out throughout the whole length of the bridge between trains, temporary rail-seats are being provided under the girders beyond the end of the 15-in. lift to grade the superstructure and track down 15 in. in a length of 120 ft.

New Spans and New Bridge

The new abutments required by the addition of the 40-ft. spans are each founded on 14 rail-piles each consisting of three 60-lb. unserviceable steel rails 22 ft. 6 in. long and welded together in the form of a triangle, the toes welded to one another.

Another major work on this relocation is the construction of a new bridge over the Mitta Mitta, consisting of three spans of 60 ft. and 19 of 30 ft. Considerable difficulty was experienced in de-watering the foundations for the piers under the 60-ft. spans.

RETIRED RAILWAY OFFICERS' SOCIETY.—Some 50 members of the Retired Railway Officers' Society attended the annual meeting at the Great Eastern Hotel, Liverpool Street, on February 11. The report for 1957 was proposed by the retiring President, Mr. George Morton, and duly adopted. The report stated that a new record of 186 members had been reached, that 11 members had died (including two in their 94th year), and that 14 new members had been elected, among whom was Sir Ralph Biddle, formerly Docks & Marine Manager at Southampton. The principal social activities of the Society during the year included a day trip to the Isle of Wight, when 52 members and their ladies enjoyed a long motorcoach drive on the island. The monthly meetings were well supported by an average of 44. Reference to the autumn luncheon at the May Fair Hotel, London, was made in our issue of November 8, 1957. The statement of accounts for the year shows a credit balance of £578 19s. ½d.; of this, £180 12s. was derived from entrance fees and subscriptions. The investment account showed a total of £381 9s. 9d. in National Savings Certificates. A vote of thanks was accorded to Mr. Morton for his work as President during the year. Mr. H. G. Rampling, formerly District Operating Superintendent, Norwich, London & North Eastern Railway, was unanimously elected President for the current year. Mr. F. E. Cox was thanked for his great services as Hon. Secretary during the past 10 years, and was presented with a cheque. Mr. J. W. Kerr, formerly Treasurer, London Midland Region, was appointed Hon. Secretary for 1958. The Hon. Treasurer, Mr. J. H. Laundy, who was standing for a further term, was thanked for his efficient services, as were Mr. F. H. Sedgwick and Mr. J. T. Drinkwater, who were again elected Hon. Joint Auditors.

BRITISH RAILWAYS INTER-REGIONAL BOXING CHAMPIONSHIPS.—Ten years of inter-Regional boxing are marked by the 1958 championships of the British Railways Boxing Association, which have started with eliminating bouts in the Scottish, Western, and London Midland Regions. The other Regional contests will take place this month at Doncaster (Eastern), Clapham (Southern), and York (North Eastern). The winners of Regional contests will qualify for the inter-Regional quarter-finals at Bristol on March 21, to be followed by the semi-finals at York on April 18, and the finals at the Royal Albert Hall, London, on May 8. Two hundred railwaymen have entered for the championships.

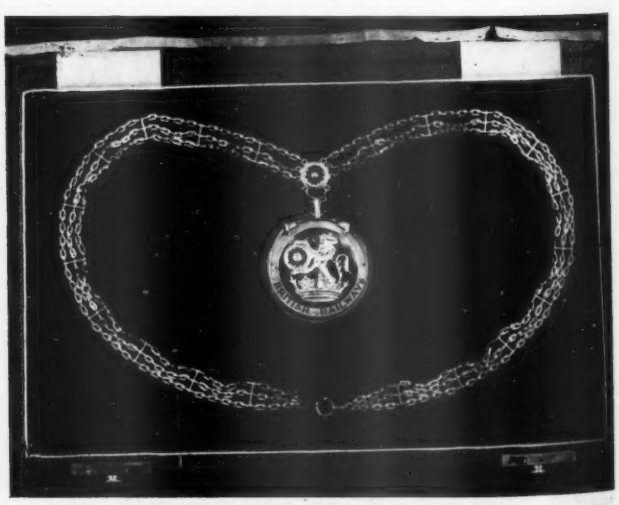
RAILWAY BENEVOLENT INSTITUTION.—At a meeting on February 17, the board of the Railway Benevolent Institution granted annuities to two widows involving an additional liability of £45 a year. Sixty-eight gratuities were also granted, amounting to £668, to meet cases of immediate necessity. Grants from the Casualty Fund made during January amounted to £1,344.

BRITAIN'S RAILWAY QUEEN

Mr. J. Lawton, Chairman of Railway Queen's Council

Mr. W. H. Ferran, General Secretary of Railway Queen's Council

Miss Teresa Boyden
Britain's Railway Queen for 1957-58



Insignia of Railway Queen : (left): International Chain, with emblem of the United Nations Association as centre-piece ; (right): Chain of Office presented on January 23, 1957, *by Sir Brian Robertson, Chairman of the British Transport Commission (see editorial in this issue)*

RAILWAY NEWS SECTION

PERSONAL

In the biography of Mr. G. T. Owen, Managing Director, North British Locomotive Co. Ltd., published in our last week's issue, we incorrectly stated that Mr. Owen had been appointed President of the Locomotive & Allied Manufacturers' Association of Great Britain. Mr. Owen has been appointed Chairman of that Association, as stated in the caption to the accompanying illustration.

The late Mr. C. A. White

Signal & Telecommunications Engineer, Southern India Railway, 1948-54

Mr. George F. Buckingham

Appointed Vice-President of Traffic, Canadian Pacific Railway

We regret to record the death on December 11, at the age of 55, of Mr. Cyril Arthur White, Signal & Telecommunications Engineer of the Southern India Railway from 1948 until his retirement in 1954. Mr. White, who was responsible for the introduction of the modern type of double-wire signalling on the Southern India Railway, was the first independent Signal & Telecommunications Engineer to be appointed on an Indian railway system. He was born at Teddington on June 16, 1902, and educated at Kings College, Wimbledon. In 1920 he became a pupil at the Chippenham Works of Saxby & Farmer Limited (later the Westinghouse Brake & Saxby Signal Co. Ltd.). In due course he transferred to the London office of that company to complete his training. In 1928 he was appointed to the South Indian Railway as an Assistant Signal Engineer at Trichinopoly. Here he assisted with the 19-mile Madras Beach-Tambaram electrification—the first metre-gauge electrification to be carried out in India. Mr. White was also closely connected with the remodelling and electrification of several main junction stations, notably Trichinopoly, Salem, and Erode Junctions. He was also keenly interested in multiple-aspect signalling, then under active consideration on Indian railways, and, more especially, in the double-wire system. At that time, several sections of broad- and metre-gauge rail of the South Indian Railway were being equipped with the latter system. Mr. White became Signal & Telegraph Engineer in 1946 and, on partition in 1948 and the resultant amalgamation of the South Indian and Mysore Railways with part of the Madras & Southern Mahratta system, was appointed Signal & Telecommunications Engineer of the newly-formed Southern India Railway. He was thus the first independent Signal & Telecommunications Engineer to be appointed on an Indian railway. He retired from this position in May, 1954. Mr. White had joined the Auxiliary Force (India) on his arrival in India, and, during the 1939-45 war, was seconded to the Corps of Indian Engineers with the rank of Major. He was a keen musician and never happier than when playing the piano or helping with some local choral party.

Mr. J. V. Forrest, Superintendent, Fort William Terminals, Canadian Pacific Railway, has been appointed General Superintendent of the Saskatchewan District at Moose Jaw. He succeeds Mr. L. R. Smith, who moves to Vancouver. Mr. W. L. Wilson, Superintendent, Kenora, succeeds Mr. Forrest at Fort William; Mr. C. F. Gwyn, Assistant Superintendent, Calgary, is promoted to Kenora with Mr. A. L. Blaser, Assistant Superintendent, Lethbridge Division, Fort Macleod, taking over at the western point. Mr. L. R. Smith, General Superintendent, Saskatchewan District, Moose Jaw, succeeds Mr. J. C. Jones, General Superintendent, British Columbia District, who has retired.

Mr. George F. Buckingham, General Traffic Manager, Canadian Pacific Railway, who, as recorded in our January 6 issue, has been appointed Vice-President of Traffic for that system, was born in Montreal and joined the C.P.R. there 50 years ago as a junior clerk. He was in the Canadian Army during the 1914-18 war until his discharge on medical grounds in 1918. He won steady promotion and became General Freight Agent in 1936. In 1948 he was appointed Freight Traffic Manager at Winnipeg, in charge of freight traffic for both the Prairie and Pacific regions. He returned to Montreal in 1949 as Assistant General Traffic Manager with system jurisdiction. In 1950 he took over the position of General Traffic Manager, the position he now vacates.

Sir George Bolton has been appointed a director of the Canadian Pacific Railway Company in place of the late Viscount Waverley, whose death was recorded in our January 10 issue.

Mr. R. F. Graveson

Appointed District Commercial Officer, Cambridge, Eastern Region

Mr. W. Jackson

Appointed District Operating Superintendent, Leicester, L.M. Region

Mr. H. M. Herbert

Appointed Assistant to Chief Operating Superintendent, Scottish Region

Mr. R. F. Graveson who, as recorded in our February 7 issue, has been appointed District Commercial Officer, Cambridge, Eastern Region, British Railways, joined the London & North Eastern Railway as a Traffic Apprentice in 1933. From 1940 to 1944 he was Assistant to the District Goods & Passenger Manager, Peterborough, and later occupied a similar position in Nottingham. In 1947 he became Head of the Canvassing & Development Section, Norwich, and, two years later, was appointed Goods Agent & Yardmaster, Boston. He remained in this position until 1955 when he became Assistant to the District Goods Manager, Sheffield. In the same year he was promoted to be Assistant District Goods Manager, Sheffield, the position he recently vacated.

Mr. W. Jackson, who, as recorded in our February 7 issue, has been appointed District Operating Superintendent, Leicester, London Midland Region, British Railways, joined the North Eastern Railway as a clerk at York in 1917. In 1925 he became a Traffic Apprentice. He subsequently was appointed Stationmaster at Moorhouse and Upton & Hamsworth, and, later, Head Office Inspector (Central Wagon Control), York; Freight Trains Inspector, Operating Superintendent's Office, York, and, in 1942, Assistant Goods Agent at Leeds, Wellington Street. Mr. Jackson transferred to Gascoigne Wood as Mineral Traffic Agent in 1943, and, the following year, returned to York as Head of the Outdoor (Rules) Section of the Operating Superintendent's Office. He became Assistant to the District Operating Superintendent, Edinburgh in 1946, and, three years later, took up similar positions at Burntisland and Glasgow. He became Freight Trains Assistant to the Operating Superintendent, Glasgow, in 1953, and District Operating Superintendent, Birmingham (Western), in February, 1955. It is this position he now vacates.

Mr. H. M. Herbert, who, as recorded in our January 31 issue, has been appointed Assistant to the Chief Operating Superintendent, Scottish Region, British Railways entered the service of the former London & North Eastern Railway at Ely in November, 1933, as a clerk. After service at a number of stations and in the office of the District Goods & Passenger Manager, Cambridge, he was transferred to the Chief General Manager's Office in 1938. He enlisted in the Royal Engineers (Transportation) in 1940 and served in India. In 1945 he became A.D.Tn. (Rail) G.H.Q., before being demobilised in 1946 with the rank of Lieutenant-Colonel. He returned to the District Superintendent's Office, Cambridge, and later transferred to the Locomotive Running Superintendent's Office, Liverpool Street.

Mr. T. Tulloch

Appointed Shipping & Port Superintendent, Parkeston Quay, Eastern Region

Mr. A. T. Chapman

Stationmaster, Victoria, Southern Region, British Railways, 1943-57

Mr. John Pollard

Appointed District Traffic Superintendent, Stoke, L.M. Region

Training as a Traffic Apprentice in the Scottish Area followed, and he served then in the offices of the Operating Superintendent and District Commercial Superintendent, Edinburgh, and in the Chief Regional Office at York. In 1952 he was appointed Assistant to the District Commercial Superintendent, Edinburgh, and, in January, 1955, Secretary to the Scottish Area Board, the position he now vacates.

Mr. T. Tulloch, Docks Manager, Fleetwood, who, as recorded in our January 24 issue, has been appointed Shipping & Port Superintendent, Parkeston Quay, Eastern Region, British Railways, was educated at Malet Lambert High School, Hull, and entered railway service in 1923 at Hull Docks. In 1932, he was appointed a Traffic Apprentice and subsequently became Supernumerary Assistant to the District Superintendent, Manchester. During the war Mr. Tulloch served with the R.N.V.R. and also in the Army, in which, with the rank of Major, he was latterly attached to the Royal Engineers (Transportation) as Liaison Officer between H.Q. 21 Army Group and the German Railways. He returned to the L.N.E.R. in 1946 and, the same year, became Assistant to the District Superintendent, Glasgow. The following year he took up a similar position in Hull. In June, 1948, he became Dock Superintendent, St. Andrews Dock, Hull, and subsequently occupied a variety of positions in Hull Docks. He became Docks Manager, Fleetwood, in 1953.

Mr. A. T. Chapman, formerly Stationmaster at Victoria, Southern Region, British Railways, who, as recorded in our November 1 issue, has retired, began his railway career with the former L.S.W.R. at Halwill Junction in 1908 as a booking clerk. From there he transferred successively to Okehampton, Plymouth, Basingstoke, Weybridge, Cobham, and Waterloo. Here he served in the Divisional Superintendent's Office as a relief clerk and Relief Stationmaster. For the next 20 years he acted as Relief Stationmaster at every station between Waterloo and Southampton. He became Assistant Stationmaster at Waterloo in 1932, Senior Assistant Stationmaster in 1935, and Stationmaster at Clapham Junction in 1939. The four years which Mr. Chapman spent at the latter station were vital in the history of rail transport. During the 1940-41 air raids Clapham Junction frequently became the terminus for Waterloo and Victoria traffic and at one period, 500 buses were used to carry passengers between the station and the various London termini.

Mr. John Pollard, T.D., District Operating Superintendent, Stoke, London Midland Region, British Railways, who, as recorded in our January 10 issue, has been appointed to the newly-formed position of District Traffic Superintendent, Stoke, took up his new duties on New Year's Day. He is in charge of both the Commercial and Operating Departments in the Stoke Area. Mr. Pollard began his railway career with the former L.M.S.R. at Stacksteads, Lancs, in 1934, and served at various stations before being commissioned in the Lancashire Fusiliers (Territorial Army) in 1939. Mr. Pollard served in France, Belgium, and the Middle East, and rejoined the Territorial Army in 1947. He was awarded the Territorial Decoration in 1948. In July, 1947, at the completion of his training as a Traffic Apprentice he was appointed Assistant to the District Operating Manager, Crewe, and, in 1951, he became Assistant District Operating Superintendent, London (Midland). Three years later Mr. Pollard moved from the London (Midland) to a similar position in the London (Western) District. He was appointed District Operating Superintendent at Stoke in September, 1956. During the winter of 1955-56 he was one of a party of four British Railway representatives who spent three months studying modernisation of the French Railways.

Mr. I. R. Gamble has been appointed District Commercial Officer, Peterborough, Eastern Region, British Railways.

Mr. F. M. Wright has been appointed District Commercial Officer, Kings Cross, Eastern Region, British Railways.

Mr. F. E. Cox has retired from the office of Honorary Secretary of the Retired Railway Officers' Society. He is succeeded by Mr. J. W. Kerr.

Mr. C. G. Palmer has been appointed Motive Power Officer, in the office of the Line Traffic Manager (Great Northern), Kings Cross, Eastern Region, British Railways.

Mr. J. L. Dickinson has been elected a special director of the Skefko Ball Bearing Co. Ltd. and will assume the position of Executive Assistant to the Managing Director. He will continue as Secretary of the company.

Mr. Leonard Blake, General Representative for the Tyre Division of the Dunlop Rubber Co. Ltd. in Worcestershire, has been appointed Assistant District Manager Birmingham (South) for that company. He is succeeded in Worcestershire by Mr. Desmond Horne.

Last week we stated that Mr. C. Pritchett had retired from Chloride Batteries Limited after 25 years of service with that company. This was incorrect. The retiring Manager of the company's Exide & Drydex Replacement Sales was Mr. H. E. Bayman, to whom Mr. Pritchett made a presentation on behalf of 149 members of the staff.

Mr. George A. Newill, who served for 20 years on the Great Western Railway before joining the Goodyear Tyre & Rubber Co. (G.B.) Ltd. in 1947, has been appointed Traffic Manager of that company. He succeeds the late Mr. J. Brennan.

Mr. Eric E. R. Fuchs has now joined Ruston & Hornsby Limited as Personal Assistant to Mr. T. L. Kendall, Sales Director. Mr. Fuchs, who received his early training at a Tyneside shipyard, later studied in Switzerland. He joined the English Electric Co. Ltd. in 1938 and was engaged on diesel engine research and development. Later he became Technical Delegate in the Middle East for the English Electric Group, returning to the diesel engine division in 1952 as Assistant to the General Manager. In that capacity he specialised on the export activities of the division and travelled overseas extensively.

Mr. L. H. E. Jones, Technical Representative of the Overseas Division of Expandite Limited, will shortly leave this country for a tour of Scandinavia.

We regret to record the death, on February 2, of Mr. A. E. Hukins, the Founder & former Managing Director of E.N.V. Engineering Co. Ltd.

Mr. David C. Nutting has joined the board of Solartron Industrial Controls Limited, a member company of the Solartron Electronic Group.

Mr. Keith Tregear, Grad.I.C.E., Messrs. Rendel, Palmer & Tritton, Karachi, Pakistan, has been elected an associate member of the Institution of Civil Engineers.

Mr. W. E. Gelson, formerly of the Indian State Railways, has been taken into the partnership of Sir Bruce White, Wolfe Barry & Partners, Consulting Engineers, Westminster.

Mr. J. Strong, a director of the British Oxygen Co. Ltd., has relinquished his appointment as Chairman of Quasi-Arc Limited on being appointed Chief Executive Director of British Oxygen Gases Limited.

Mr. E. H. Brook has been appointed Chief Chemist of Small & Parkes Limited. He joins the company after 12 years of service as a development chemist with Bakelite Limited.

Mr. N. G. P. Boswood, Secretary of George Cohen 600 Group Limited, has been appointed a director of the Colchester Lathe Co. Ltd., a member company of the group.

Mr. H. Haworth has been appointed Planning & Progress Engineer at the Templeborough Works of Steel, Peech & Tozer, a branch of the United Steel Companies Ltd. He succeeds the late Mr. H. Lawson.

Mr. J. H. Mayes, General Sales Manager of the Northern Aluminium Co. Ltd., has been appointed a director of that company. He was appointed to his present position as head of the Sales Department in April, 1957, succeeding Mr. S. E. Clotworthy when the latter was appointed Managing Director.

The following members of the staff of the Chief Civil Engineer of the Southern Region of British Railways have been elected Associate Members of the Institution of Civil Engineers:—

Mr. J. K. Bucknall, Engineering Assistant, London (Western), District Engineer's Office, Woking.

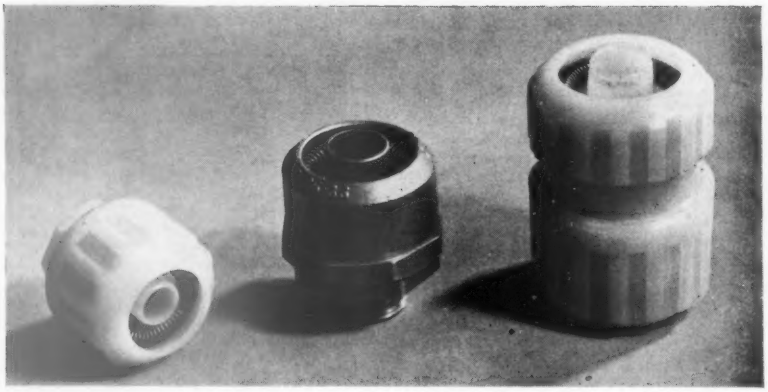
Mr. R. D. Lloyd, Senior Engineering Assistant, Modernisation Section, Waterloo.

Mr. R. W. Turner, Senior Engineering Assistant, London (Eastern), District Engineer's Office, Purley.

Mr. C. G. Palmer, District Motive Power Superintendent, Peterborough, Eastern Region, British Railways, has been appointed Motive Power Officer, Office of the Line Traffic Manager (Great Northern), Kings Cross, Eastern Region, British Railways.

INCLUSIVE RAIL AND HOTEL TICKETS FOR EASTER WEEKEND AT BLACKPOOL.—As a result of the success of arrangements made last year by the Scottish Region of British Railways for visitors from the West of Scotland to spend the Easter weekend in Blackpool similar facilities have been arranged this year. They include travel by special train, with a guaranteed seat in both directions, with reserved accommodation in a choice of boarding houses or hotels. The inclusive charge varies, according to the accommodation selected, from £4 5s. to £5 from stations in Glasgow and district. The accommodation will be reserved from breakfast on Easter Saturday until lunch on Easter Monday, both meals inclusive. Cafeteria cars will run in the special trains.

NEW EQUIPMENT AND PROCESSES



One-Piece Hose Coupling

A HOSE coupling has been developed for use with low- and medium-pressure compressed air and fluids. Railway applications of this, the Free-End coupling, include the coupling of flexible air pipes in workshops; it may also, possibly, be used for fuelling diesel locomotives.

Advantages claimed for the coupling are that it forms a one-piece unit which need never be dismantled; that no preparation of the end of the hose is required; and that no tools are required for fitting or removing the hose.

For a given inside dia. of hose a given coupling can accept varying wall thicknesses. The hose can be entered or removed as often as required, the average time for effecting a joint being 10 sec. When manufactured in nylon the items are light in weight.

Two designs of couplings manufactured in nylon and suitable for working pressures up to 250 lb. per sq. in. are available; similar items in brass will shortly be available.

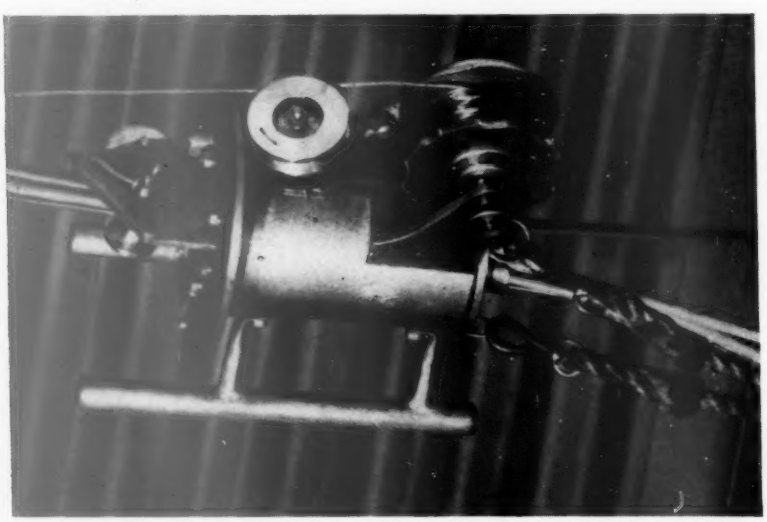
One design, Type D, is used for joining two lengths of rubber or plastic hose together. The free end of a piece of hose is inserted into each end of the coupling; the body portion of the coupling is then screwed up by hand until the two hoses are securely locked. In this process the hose is progressively gripped by an internal helical steel spring which is reduced in diameter in a conical section of the body.

The other coupling, Type S, has one end threaded for attachment to a tool, or to a supply point for permanent coupling. The other end accepts the free end of the hose which is locked tightly by screwing home the body portion by hand. The two couplings in nylon, and the Type D in brass, are seen in the illustration.

Full details of the Free-End couplings can be obtained from the manufacturer, Airtech Limited, Engineering Division, Haddenham, Bucks.

Small Cable Spinner

OVERHEAD catenary-supported cables up to 1-in. dia. form a convenient means of medium-power distribution, for example, between buildings on many types of sites, particularly where the occupation is temporary, such as at premises erected for new works; but the system may also be used in large workshops where the cables can be run between the roof trusses.



A 1 in. cable spinner has been introduced specifically for these applications, where portability and easy manipulation are considered important. The spinner consists of a rotating drum on which is mounted the spool of wire for lashing the cable to the catenary. Two feet on the drum act as a counterbalance to the spool when it rotates and also form a support for the spinner when on the ground.

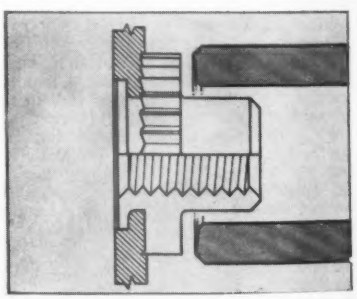
To prepare the spinner for use, the catenary and cable are threaded through the drum and the spool of lashing wire is placed in position. The wire is then passed round a friction wheel attached to the drum and bearing against the end plate of the spinner, and is clamped to the catenary between fixed and adjustable rollers.

When the catenary is in position between the supports of the span, the spinner is pulled along it by hand by means of a towing rope attached to the front of the machine. As the lashing wire is paid out from the spool, it causes the friction wheel to rotate so that it travels around the circumference of the end plate and turns the drum, carrying the wire round the cable and the catenary in a spiral as the spinner moves forward along the span. The accompanying illustration shows the unit in use.

Details of the spinner are obtainable from Pirelli-General Cable Works Limited, Eastleigh, Hants.

Tapped Bushes for Sheet Metal

THE Rosan Press-nut, for obtaining deep tapped holes in thin sheet metal, is now being manufactured in this country under licence. An advantage of the



design is that it is lighter and smaller than any existing devices.

The nut is being manufactured in all threads up to $\frac{3}{8}$ in. and can be supplied with any thread to special requirements.

For fitting a nut, a hole is drilled or punched in the sheet to the correct size, and the smaller flange of the nut inserted into the hole. Then a hollow punch is placed over the nut and struck sharply once or twice. The impact forces the sheet metal to flow into the space between the flanges, as the illustration shows, locking the Press-nut securely in place. The teeth of the serrated flange broach themselves into the parent metal preventing rotation.

Further details may be obtained from Instrument Screw Co. Ltd., Northolt Road, South Harrow, Middlesex.

Ministry of Transport Accident Report

Portsmouth & Southsea, April 15, 1957: British Railways, Southern Region

Colonel W. P. Reed, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at about 4.47 p.m. on April 15, 1957, at Portsmouth & Southsea.

In this case, the 4.45 steam passenger train to Salisbury, consisting of five corridor coaches behind a four-wheel van drawn by a class "4" 2-6-0 engine, which had left platform No. 2 under clear signals to the up main line, was struck on the side by the leading vehicle of a set of eight empty bogie coaches. The latter, through a misunderstanding, were being propelled from a siding by a 0-4-4 tank engine running chimney first and became derailed at some trap points. Combined speed was about 20 m.p.h. and the leading empty coach became wedged between a wall and the outgoing train, the third vehicle of which was cut away for half its length and had four of its seven compartments wrecked. The passenger train stopped about 70 yd. beyond the point of impact with the middle of its last coach opposite the leading end of the empty stock; some of its wheels became derailed but the down line was not fouled and the 2.27 electric passenger train from London, which had passed the home signal before the accident, stopped alongside the Salisbury train when current was cut off about half a minute later.

Four passengers were seriously injured and three others suffered from minor injuries and shock. Ambulances arrived within 10 min. and there was no unavoidable delay in removing the injured to hospital. A short-circuit on a conductor rail set fire to some protective boarding and a boarded walkway, but the flames were extinguished before the fire brigade arrived, with the ambulances. Current was eventually cut off but restored on certain lines at 6.4 and emergency services put into operation. A breakdown crane failed on its way to the site, which delayed clearance of the wreckage, but normal working was resumed at 10.50 a.m. the following day. The weather was fine. The diagram on page 230 shows the lines, signals, and so on, immediately involved in the incident.

Course of Events and Evidence

The empty coaches had been standing in the middle siding between platforms Nos. 2 and 3 and were to form the 5.45 train to Cardiff, which is well patronised. To afford more time in the departure platform they are often taken forward into the sidings outside the station before the 4.45 train leaves. On this occasion the shunting engine was brought into the middle siding in good time, so as to allow its crew to be relieved and catch the Salisbury train.

As there was time, the signalman sent the empty stock away to the sidings outside, from which the propelling movement later was made. After this the trap points were opened to allow the starting signal to be cleared for the Salisbury train and it is known that shunt signals 50 and 70 were then properly at danger.

Because of a kink (not shown on our diagram) in the alignment of the shunting neck these signals cannot be seen by a driver if standing on the right looking towards the station when at the head of vehicles. Nor can the shunter be seen from the other side unless he is standing away from the sidings and on or near the up main line.

The driver of the Salisbury train said he started briskly, reaching about 10 m.p.h. at the footbridge, and was looking for the advanced starting signal when he noted the empty coaches moving towards his train and applied the brake. As he was coming to a stand he saw the head shunter fall in trying to get into one of them. This man, some minutes after the accident, asked him why he had left the station, and the driver told him not to talk nonsense. The conversation was confirmed by the fireman who thought, however, that the words were shouted from the ground as they were stopping.

The shunter, who denied saying anything of the kind, had coupled the shunting engine to the empties as soon as it arrived in the middle siding. He stated that he told its driver—a passed fireman—about the movement to be made before leaving there. His evidence on what he said, however, was not at all clear. He said he travelled on the step of the leading coach and alighted on the signalbox side of the footbridge, giving the stop signal by holding up both arms. The coaches stopped with the rearmost between signals 70 and 50. He made no other hand signal before turning and walking under the footbridge to talk to the signalmen about subsequent shunting moves, taking off his heavy plastic gloves and putting them under his arm. He was standing on a boarded walk between No. 5 siding and the outgoing line from platforms 1 to 4, and the signalmen warned him to stand clear of the Salisbury train.

Stepping towards the footbridge he saw the empty coaches moving towards him and ran to stop them, but could not move fast; he had to avoid a conductor rail and stumbled once. He could not see the shunting engine driver because of the alignment, and was trying to get into a guard's compartment in the third vehicle from the end when the collision occurred. He did not ask the passenger train driver why he had started, nor did he challenge the shunting engine driver as to why he had commenced the propelling movement.

The latter was positive that he had not been told anything of the work to be done before receiving the order "pull up" while the shunter was on the engine step; but he knew that the propelling movement later would be into one of the platforms and across the route taken by outgoing trains. He was sure that the shunter travelled on the engine step and that, after he alighted, he himself had to lean out of the cab to see the hand signal to stop. After doing so he released the brake and saw the shunter still in the same place, who gave a "come back" signal by swinging his arm upwards and towards the station. This is not a Rule Book signal, but the driver said it was often used and he was quite satisfied as to its meaning.

When he looked out again—he was on the left of the engine—he could not see the shunter; but observing the engine of the Salisbury train appearing, he realised that the route could not be set for him and promptly applied the brake, not knowing that the leading vehicle already was derailed. The shunt signal, which came into the view of the fireman at that moment, was at danger. He knew the passenger train was due to leave at 4.45, but did not think of it when receiving the "come back" signal. It was not possible to see fixed signals when beginning to shunt from the neck in this way; he was working solely by hand signals, as usual. His fireman, a passed cleaner, confirmed that the shunter was on the engine step at first; they had been propelling for about two coach lengths when the driver braked.

The two signalmen had been talking to the shunter, but said he was hidden from their view by the footbridge when the shunting engine driver claimed to have been given the "come back" signal. He spoke normally to them and did not appear surprised when told to stand clear of the Salisbury train. They promptly restored signals after the accident and arranged for current to be cut off but omitted to send the "obstruction danger" signal; probably they were distracted by concern for the shunter who had, they thought, been trapped and killed.

The short circuit which caused the fire mentioned was probably only momentary, as the tripped circuit breakers at Fratton sub-station remained in when closed again; they were opened by hand once more at the signalmen's request about ½ min. later.

Inspecting Officer's Conclusion and Remarks

Colonel Reed finds it difficult to reconcile discrepancies between the evidence of the shunter and that of the shunting engine driver; he cannot believe that the latter began to propel without seeing some arm movement which he took to be a calling back signal, but he finds it also difficult to believe that the shunter momentarily forgot the outgoing train and intentionally gave a signal to move. The driver's evidence was clear, and Colonel Reed sees no reason to doubt his statement that the overhead swing of the arm is commonly used at Portsmouth instead of the precise and artificial movement of the forearm towards the chest from the horizontal extended position with the shunter facing the driver, as laid down in the Rule Book.

The shunter's evidence was not clear, and differed on certain points from that of the driver and fireman of the passenger train as well as from that given by the driver of the shunting engine. The impression formed was that his statements were not altogether reliable, the result in some measure, perhaps, of his having been on duty 10½ hr.; his turn had been extended from 8 to 12 hr. because of sickness. Colonel Reed is unable to accept his statement that his hand signals always were in strict accordance with the Rule Book. He may at a critical moment have swung his arm to loosen his shoulders without realising what he was doing, or made some exaggerated gesture in removing his gloves which misled the driver, although he said he was then out of his sight.

The conclusion must be that the accident was caused by a misunderstanding between the two men which might not have arisen if hand signals in accordance with the Rule Book had been habitually used here. It might also have been prevented if the shunter had moved quickly to where his hand signal to stop could have been seen. He might have moved

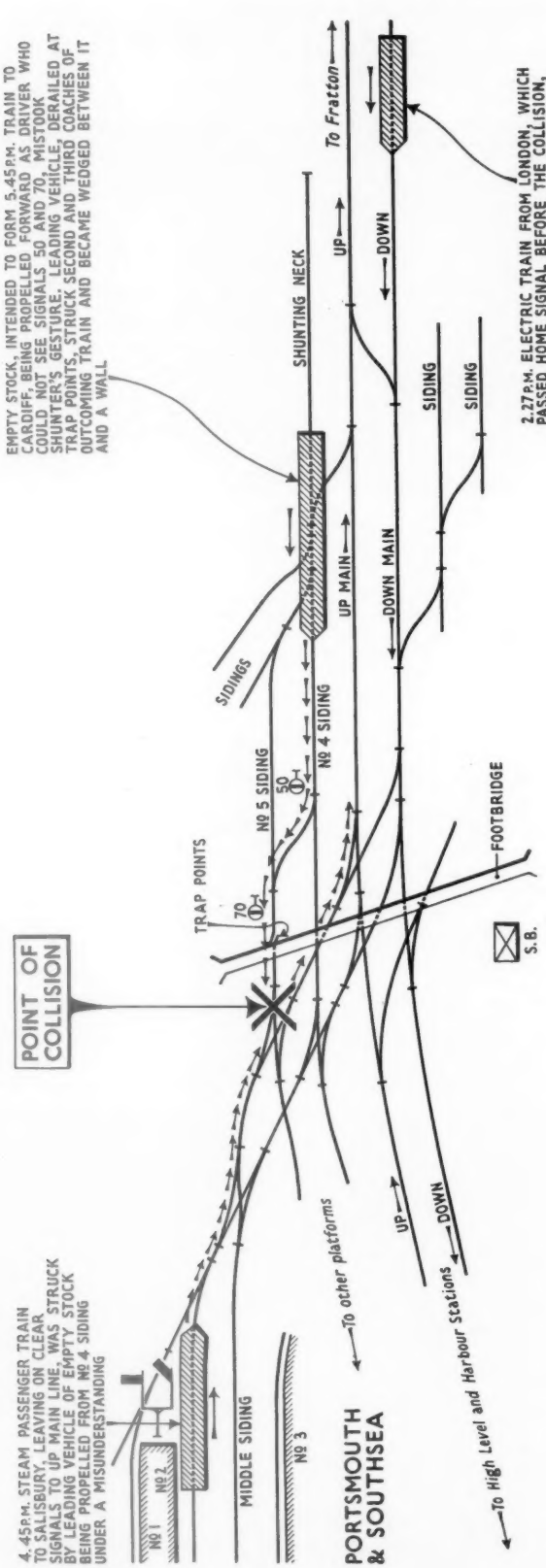

EMPTY STOCK, INTENDED TO FORM 5.45P.M. TRAIN TO CARDIFF, BEING PROPELLED FORWARD AS DRIVER WHO COULD NOT SEE SIGNALS 50 AND 70, MISTOOK SHUNTER'S GESTURE. LEADING VEHICLE, DERAILED AT TRAP POINTS, STRUCK SECOND AND THIRD COACHES OF OUTCOMING TRAIN AND BECAME WEDGED BETWEEN IT AND A WALL
2.27P.M. ELECTRIC TRAIN FROM LONDON, WHICH PASSED HOME SIGNAL BEFORE THE COLLISION, STOPPED ALONGSIDE SALISBURY TRAIN WHICH WAS NOT FOUL OF THE DOWN MAIN LINE
To Fratton
SHUNTING NECK
UP
DOWN
SIDING
SIDING
SIDINGS
UP MAIN
DOWN MAIN
No 4 SIDING
No 5 SIDING
50
70
TRAP POINTS
FOOTBRIDGE
S.B.
POINT OF COLLISION
4.45P.M. STEAM PASSENGER TRAIN TO SALISBURY, LEAVING ON CLEAR SIGNALS TO UP MAIN LINE, WAS STRUCK BY LEADING VEHICLE OF EMPTY STOCK BEING PROPELLED FROM No 4 SIDING UNDER A MISUNDERSTANDING
No 1
No 2
MIDDLE SIDING
No 3
To other platforms
PORTSMOUTH & SOUTHSEA
UP
DOWN
To High Level and Harbour Stations

Diagram showing circumstances of accident at Portsmouth & Southsea, British Railways, Southern Region, on April 15, 1957

across the electrified lines towards the box until within the driver's view; but this would have meant stepping across the up line, on which the Salisbury train was leaving, to the down, on which the one from London was due. Had he stepped over the up line and his signal to stop not been seen at once, the outgoing train would have prevented him from getting back to the empties to attempt any other action.

The unnatural character of the proper hand signal makes it all the more unmistakable, though Colonel Reed understands it cannot be seen so well at a distance as the overarm swing sometimes substituted for this reason. It may be, he thinks, appropriate to draw the attention of the staff to the importance of making this and other hand signals strictly as laid down.

There would have been no room for misunderstanding if the driver could have seen the ground shunt signal before beginning to propel. Every such movement past No. 50 signal crosses the outgoing route from platforms 1 to 4 and some cross the incoming line as well. The driver would not have begun to propel if he had seen the shunt signal at danger. View of it is very short and risk of a collision of this kind would be very much less if a better site could be found to enable it always to be seen from the shunting neck; or, if this is not possible, a repeater could be provided.

The trap points were too close to the outgoing line to prevent the collision. When they were originally laid it was necessary to have as much siding accommodation as possible in a very restricted yard; but with the advent of electrification the reduction entailed if they were moved can be accepted. Despite the difficult conditions in which the frequent shunting movements are controlled, there has been no accident on this account for a great many years. In view, however, of the risks now brought to notice it is intended to abolish No. 5 siding and re-site the catch points where they will be effective; the shunt signal also is to be moved to a better position and a repeater added if found necessary.

Highest Recorded Revenue for Rhodesia Railways

The gross revenue of the Rhodesia Railways for the year to March 31, 1957, increased by 3,760,000, and expenditure by £2,900,000. The surplus for the year was £4,740,000, against £3,880,000.

Revenue was the highest on record, resulting from the greater tonnages hauled and from the effects of the revision of rates for certain minerals.

The Railway Board comments with concern on the adverse effect on railway revenue resulting from the loss of high-rated traffic to road competition.

Estimated capital expenditure for the 4½ years to June 30, 1961, is some £44,000,000, of which £19,000,000 is in respect of additional locomotives and rolling stock. It is hoped that it will be possible to finance some portion from internal resources, with the whole of the betterment and depreciation expenditure. The Federal Government will be responsible for providing the balance of the capital required.

During 1956-57 there was £4,750,000 additional loan capital made available. At March 31, 1957, the capital totalled £81,100,000, of which £75,400,000 consisted of loans.

Demonstration Run of First Western Region Type "4" Diesel

The first type "4" 2,000-h.p. North British Locomotive Co. Ltd. diesel-hydraulic locomotive for the Western Region hauled a nine-coach train on a demonstration run last Monday. The train ran from Paddington to Bristol Stapleton Road and back.

The outward journey was via Bath; the train continued from Bristol, through Filton Junction, to join the South Wales main line at Stoke Gifford Junction returning to Paddington via Badminton.

Mr. Harold A. Watkinson, Minister of Transport & Civil Aviation; Sir Brian Robertson, Chairman, British Transport Commission; Mr. R. F. Hanks, Chairman, Western Area Board, B.T.C.; and Mr. K. W. C. Grand, General Manager, Western Region, were among the passengers on the special train.

The locomotive is described on page 221 of this issue; it is numbered D.600 and has been named "Active," being the first of a class to be named after warships. Subsequent locomotives of this series will be named "Ark Royal," "Bulldog," "Conquest," and "Cossack."

The train of some 327 tons (including a dynamometer car) covered the 119 miles to Bristol in 124½ min., with intermediate stops at Reading, Didcot, and Swindon. Fast running on the return leg was prevented by a fault in one of the engines which developed a short while after leaving Bristol. The locomotive, however, continued to haul the train, at speeds of around 60 m.p.h., arriving at Paddington some 20 min. behind schedule.

Those who travelled in the train included:

Ministry of Transport and Civil Aviation

Messrs. Harold Watkinson, Minister; J. M. Moore, Private Secretary to Minister; R. R. Goodison, Under-Secretary; Lt.-Colonel G. R. S. Wilson, Chief Inspecting Officer;

British Transport Commission

Sir Brian Robertson, Chairman; Sir J. Landale Train, Member; Mr. S. C. Robbins, Chief Contracts Officer;

British Railways Central Staff

Messrs. R. C. Bond, Chief Mechanical Engineer; S. B. Warder, Chief Electrical Engineer; E. S. Cox, Mechanical Engineer (Development);

Western Area Board

Messrs. R. F. Hanks, Chairman; A. Chamberlain, P. T. Heady, Alderman F. A. Parish, M. J. Ryan, Members;

Western Region

Messrs. K. W. C. Grand, General Manager; H. G. Bowles, Assistant General Manager (Administration); A. C. B. Pickford, Assistant General Manager (Traffic); J. R. Hammond, Assistant General Manager (Modernisation); R. A. Smeddle, Chief Mechanical & Electrical Engineer; M. G. R. Smith, Chief Civil Engineer; A. W. Woodbridge, Signal Engineer; H. E. A. White, Running & Maintenance Officer; C. W. Powell, Operating Officer; A. E. Flaxman, Commercial Officer; C. J. Rider, Public Relations & Publicity Officer;

Other Regions

Messrs. D. McKenna, Assistant General Manager, Southern Region; K. J. Cook, Chief Mechanical & Electrical Engineer, Eastern and North Eastern Regions; J. F. Harrison, Chief Mechanical & Electrical Engineer, London Midland Region; M. G. Burrows, Chief Mechanical & Electrical Engineer (Designate), North Eastern Region;

North British Locomotive Co. Ltd.

Messrs. T. A. Crowe, Chairman & Chief Managing Director; G. T. Owen, Managing Director; R. Arbuthnott, Director;

Sir William Stanier, Former Chief Mechanical Engineer, L.M.S.R.; Messrs. H. Arkle, European General Manager, Canadian Pacific Railway; J. C. Kenkel, European General Manager, Canadian National Railways; W. H. W. Maass, Advisory Engineer, South African Railways; R. F. Marriott, Advisory Engineer, New Zealand Railways; J. S. Tritton, Rendel, Palmer & Tritton; A. E. Turner, A. E. Turner & John Coates & Co. Ltd.; Herr Fritz Kugel, J. M. Voith Maschinenfabrik;

Sir George Briggs, Director, Brush Group Limited; Mr. H. T. Chapman, Managing Director, Armstrong Siddeley Motors Limited; Sir James Milne, Former General Manager, G.W.R.; Messrs. H. H. Phillips, Member of the Transport Tribunal; G. E. Orton, Former Chief Officer for Public Relations, G.W.R.; A. Hallworth, General Secretary, A.S.L.E. & F.; M. Black, and J. P. McCrum, Design Consultants.

Sir Brian Robertson, Mr. Harold Watkinson and Mr. K. W. C. Grand at Paddington on the demonstration run of the diesel locomotive D. 600

New Rolling Stock for Canadian National Railways

Canadian National Railways has placed orders with two Canadian manufacturers for 128 new freight wagons and work equipment wagons for the 3-ft. 6-in. gauge lines of the Newfoundland district. Details of the orders are recorded in our Contracts and Tenders columns elsewhere in this issue. They include 20 air-dump work wagons, 15 livestock wagons, 80 refrigerator wagons, and 13 hopper wagons.

The air-dump wagons, to be used in ballasting and line maintenance work, will be all-steel with a capacity of 16 cu. yd. or 30 tons. They will be 25 ft. 3 in. long. The stock wagons will be similar to others put into service on the island lines since 1949. They will be steel-framed, wooden vehicles, designed to carry either cattle or motorcars. Their capacity is 30 tons and length more than 39 ft. End doors will be fitted for handling the motorcars.

The 80 refrigerator wagons will enable the C.N.R. to expedite the movement of the rapidly growing volume of traffic in perishable goods. They will be steel-framed and wood-lined and fitted with ice bunkers at each end. Their capacity is 30 tons. The hopper wagons will be the longitudinal type, designed for carrying revenue freight traffic or in railway service on line maintenance work. They can take a 40-ton load which can be discharged through eight longitudinal doors in the bottom of each car. They will be the first of their kind to be put in service in Newfoundland, and are 39 ft. 6 in. long and can hold 1,490 cu. ft. of material.

In addition, other equipment which was previously ordered by the C.N.R. is due to be delivered this year. Included are three 1,200-h.p. diesel-electric locomotives and two depressed-centre flat wagons, the latter with a 60-ton capacity. They will be the largest freight stock ever used in the Newfoundland district.

WAGON FINANCE CORPORATION DISTRIBUTION.—The final dividend of the Wagon Finance Corporation is 1s. 6d. a share, making 2s. 1½d. for 1957 on the capital increased from £250,000 to £1,250,000 by a call up of 16s. a share, making them £1 fully paid. For 1956, an interim dividend of 4½d., a final of 1s. 1½d., and a jubilee distribution of 6d., not subject to tax, from capital reserves, were paid on 4s. shares.

WAGE INCREASE RECOMMENDED FOR C.I.E. STAFF.—The Irish Labour Court has recommended an increase of 10s. a week for nearly 8,000 staff of Coras Iompair Eireann, including bus drivers and conductors, and unskilled railway workers. If the recommendation is accepted by C.I.E. it will cost £382,000 a year. The court accepted the claim of the workers for an increase of 10s. a week in view of the level which had been established for workers in general during the past three months.

Reconstruction of Viaduct as Cellular Embankment

After slight delays caused by heavy flooding, good progress is reported on the cellular embankment which is replacing Elton Viaduct, between Crewe and Sandbach on the Crewe-Manchester line of the London Midland Region. The viaduct was built in 1842, formed of brick arches, seven openings under the slow lines and four under the fast lines—in effect, two separate bridges. The river is some 50 ft. below rail level.

Subsidence

Constant subsidence has been caused by brine pumping in local salt mines; the bridge superstructure had to be lifted several times and the abutments and wings built up to suit, and latterly, it was necessary to insert permanent steel struts between the abutments to keep them stable. Between 1892 and 1956 subsidence amounted to 16 ft.; the yearly average was 2-9 in. The present average is 8 in. a year, and it is thought that subsidence will continue indefinitely.

To overcome this, and having regard to electrification now in progress on this section, a form of cellular construction through the bridge opening is in hand. This will permit of an unlimited subsidence without having to heighten and strengthen the existing abutments by an unpredictable amount.

Honeycomb Structure

The brick arches of the viaduct were broken in and filled in. The space between river level and tracks is being filled with tiers of reinforced concrete pipes, 4-ft. internal and 5-ft. external dia. Below the bottom tier of pipes is a raft of reinforced concrete 2 ft. thick and more than 200 ft. long. The raft is below the level of the former river bed and the river flows through the bottom tier of pipes laid directly on the raft.

Eight further tiers of pipes, shorter towards the top, will give a total height of 45 ft. from the raft. The pipes in each tier are laid directly on top of those below, and spaces between them filled up with reinforced concrete and smaller pipes. The weight of the pipes and raft will be more than 6,000 tons.

The further subsidence will be dealt with in the first place by making up the track and later by adding successive further tiers of pipes.

The accompanying illustration shows the stage achieved recently in building up the layers.

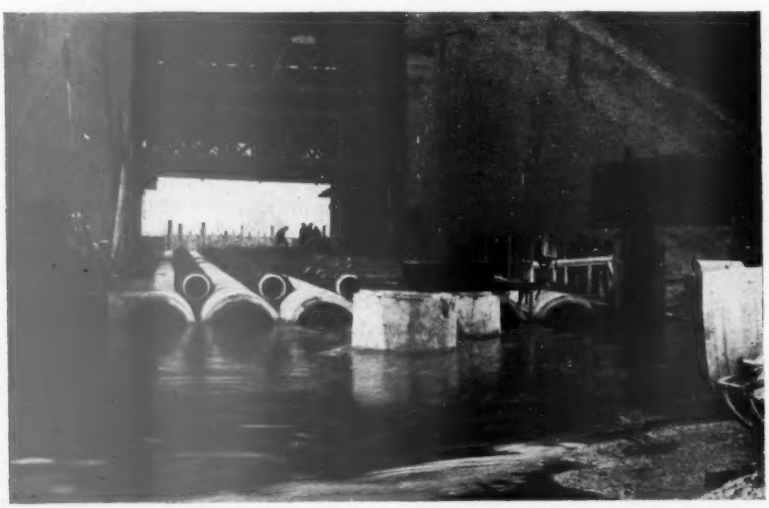
B.U.T. After-Sales Service for Indian Railways

An instruction school has been opened by British United Traction Limited at the Perambur Works of the Southern Railway, near Madras. The school has been formed to instruct the staff of the Northern and Southern State Railways of India in the techniques of servicing B.U.T. traction equipment.

B.U.T. instruction staff under the supervision of Mr. W. F. Bolton, recently appointed Service Manager of the company, give lectures and practical instruction on the six-cylinder 15·2 litre horizontal diesel engine, the transmission, and other features of B.U.T. lightweight railcars. Sound colour films, some taken on the B.U.T.-powered diesel railcars of British Railways, are used to explain driving technique, operation of the epicyclic gearbox, and the care of the diesel fuel system. Fuel-injection equipment maintenance is demonstrated to trainees during visits to the nearby Ennore works of Ashok Leyland Limited. B.U.T. has also co-operated with oil suppliers to ensure adequate instruction in the storage, handling, and dispensing of fuel and lubricants.

B.U.T. Equipment in Railcars

Concurrently with the opening of the school, 12 broad-gauge railcars have arrived in Madras from Australia. These cars, produced at the Bassendean (Western Australia) works of the Commonwealth Engineering Co. Ltd., are built under the Colombo Plan. They will operate in the Bezwada Division of the Southern Railways, will be followed later in the year by 12 more for the Northern Railway. All will be fitted with B.U.T. power, transmission, and control equipment.



Laying reinforced-concrete pipes to form the cellular structure replacing the brick arch viaduct at Elton, London Midland Region

Questions in Parliament

Lewes-East Grinstead Line

Mrs. Evelyn Emmet (E. Grinstead—C.) asked the Minister of Transport & Civil Aviation on February 12, when the report of the Central Transport Consultative Committee on the proposal of the B.T.C. to withdraw train services from the Lewes-East Grinstead line would be published.

Mr. Harold Watkinson, in a written answer: Copies of the report will be available this afternoon. The Committee has concluded that although the financial savings from closing the line appear to be considerably less than the railways had estimated, they are still substantial and that in the public interest the continuing losses cannot be justified. It has accordingly recommended that the line should be closed. It has also made recommendations about the information to be furnished by the B.T.C. in support of future proposals to withdraw services. The Commission have informed me that services between Lewes and East Grinstead will now be withdrawn on March 17. As regards future proposals for the withdrawal of services the Commission tells me it is anxious to find a satisfactory basis for the submission of supporting financial information and intends to have early discussions with the Committee on this question.

Parliamentary Notes

Roads v. Railways

Sir Charles Taylor (Eastbourne—C.) in a general debate on road accidents which he initiated in the House of Commons on February 14, said he had received some communications from "a Brigadier Lloyd, of the Railway Conversion League." His plan seemed to be that if all railways were converted into roads both goods and passenger traffic could be carried very much quicker and much more cheaply than it was at present being carried by the railways.

That might sound fantastic, Sir Charles Taylor added, but as they were spending £1,200 million on railway modernisation, it might not be as fantastic as it at first appeared. The Minister of Transport should give the suggestion intelligent consideration, because it might well be that acceptance of part of the plan would help to solve some of their problems.

Victoria Tube

Mr. Ernest Davies (Enfield E.—Lab.), in the same debate, stated that the Victoria Tube would take a very considerable amount of traffic off the streets of London. Although whenever a rail accident or air crash occurred, the public was shocked at the tragic loss of life, often the number of fatalities which attained headlines was no greater than the number killed on the roads on the same day. The public seemed to accept road accidents too readily.

Mr. G. R. H. Nugent, Joint Parliamentary Secretary to the Ministry of Transport & Civil Aviation, agreed with Mr. Davies. It was the constant concern of the Government to try to bring home to the mind of the average person that he was quite likely to have an accident not through anything criminal or vicious, but occasioned simply by lack of care or by lack of observance of the normal simple rules of the road.

Contracts and Tenders

Diesel-electric locomotives for Brazil and Nigeria

General Motors Overseas Operations has received an order from the Rede Ferroviaria, Brazil, for 100 diesel-electric locomotives at a cost of approximately $15,500,000, the credit being arranged through the Export-Import Bank. Of the total, 70 locomotives are to be of the G.12 standard type of 1,425 b.h.p., and 30 are to be of the G.8 model of 950 b.h.p. Delivery is scheduled for the period March-September, 1958.

The Nigerian Railway Corporation has placed a contract with General Motors Overseas Operations for 18 1,425-b.h.p. main-line A1A-A1A diesel-electric locomotives. Delivery will commence in seven months and be completed in 10 months. The total cost of the order, including agreed spares, is reported to be some £1,287,000.

Canadian National Railways has placed orders for 128 freight wagons and work equipment wagons for the Newfoundland district. The Eastern Car division of Dominion Steel & Coal Corporation will build 20 air-dump work wagons and 15 livestock wagons, while Canadian Car Co. Ltd. will supply 80 refrigerator wagons and 13 hopper wagons, all specially designed for service on the Newfoundland lines.

South African Railways have awarded the contract for the building of two bridges on the Johannesburg-Durban main line to John Laing & Son (S.A.) Ltd. The bridges, both of reinforced concrete and 180 ft. in length, are to be built near Standerton and Volksrust.

British Transport Docks have placed the following contracts:

Stothert & Pitt Limited, Bath: 10 three-ton single rope cranes, and one 10/3-ton single rope crane

Cowans Sheldon & Co. Ltd., Carlisle: one 10-ton four-rope grab crane.

British Railways, London Midland Region have placed the following contracts:—

E. B. Jones & Rawlinson Limited, Salford, 6: new parcels office and alterations to existing accommodation at Heald Green Station

Thos. Wrigley Limited, Prestwich, Manchester: demolition and removal of Cattle Docks at Windsor Bridge, Salford

Gee, Walker & Slater, Limited, London, W.1: improved accommodation for yard inspectors and shunters at St. Pancras

Mechanised Contractors (London) Limited, Ealing Broadway, W.5: formation renewal, ballasting, and drainage of a portion of the down line at Braunston and Willoughby

Norris Warming Co., Ltd., Salford 3, Manchester: heating installation in District Engineer's Workshops at Lune Road, Lancaster

Aerocem Limited, London, W.1: repairs to embankment on down fast line near Bedford

Henry Tattersall Limited, Rochdale: heating and hot and cold water supplies in Iron Foundry, Horwich Locomotive Works.

British Railways, Eastern Region, have placed the following contracts:—

Aubrey Watson Limited, Henley-on-Thames, Oxon: waterproofing of arches carrying up Cannonbury line at Finsbury Park Station

James Kilpatrick & Son Limited, Westminster, London, S.W.1: supply, delivery and installation of electric lighting and power equipment throughout the maintenance shed, boilerhouse, oil store, and pumphouse at Cambridge Diesel Maintenance Depot

Johnson & Phillips Limited, Charlton, London, S.E.7: supply and maintenance of signalling and telecommunications cables at Hitchin

Mechanised Contractors (London) Limited, Ealing Broadway, London, W.5: blanketing and drainage of up and down main lines at Huntingdon North Station

Henry W. West Limited, Newbury Park, Ilford, Essex: cleaning and painting of station buildings, offices, goods yards, sheds, motive power depot, signals, signalboxes, point rodding and bridges at Clacton-on-Sea and Thorpe-le-Soken Stations.

British Railways, North Eastern Region, have placed the following contracts:—

Colt Ventilation Limited, Surbiton: heating installation, York Railway Museum

Steels Engineering Products Limited, Manchester: three 6½-ton Coles diesel-electric mobile cranes

Holman Bros. Limited, Sheffield: Holman Tractair compressor

J. Scott & Co. (Electrical Engineers) Ltd., Newcastle upon Tyne: electrical installation, Heaton Carriage Washing and Standing Shed

The Butler Machine Tool Co. Ltd., Halifax: one axlebox slotting machine, Darlington Loco Works.

The Ministry of Public Works, Madrid, Spain, is calling for tenders for two diesel locomotives for the port of Huelva. Offers are invited from foreign firms. The full conditions and specifications are available at the Directorate-General of Ports of Maritime Signals in the Ministry of Works, Madrid. The locomotives must be fitted with electric starting gear and compressed air brakes.

Offers should be presented to the Secretary of the Huelva Port Works Board or the Ministry of Public Works (Dirección General de Puertos y Señales Marítimas), Paseo de Atocha 1, Madrid, before March 3, 1958. They will be examined on March 10. Foreign firms should obtain legalisation of their tender documents from either the Spanish Consul in their own country or their Consul in Spain.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From South Africa:

20 items of non-ferrous overhead track equipment fittings, including dropper clips, clamps, and contact wire splicers.

The issuing authority is the Stores Department, South African Railways. Bids, in sealed envelopes, endorsed "Tender No. C.7107: Non-Ferrous Overhead Track Equipment Fittings," should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is March 14, 1958. The Board of Trade reference is ESB/3888/58.

From Iran:

1,800 tons of rail chairs.

Bids must be submitted in two sealed envelopes A and B. Envelope A should contain a copy of the conditions and specifications relating to the tender, and signed by the bidder to signify approval. This procedure is not considered necessary in the case of overseas firms bidding direct without the intermediary of a local agent. The envelope should, however, contain proof of a deposit equivalent to $10,000 made in favour of the Iranian State Railways, with the Bank Melli Iran, and having a validity of two months. Envelope B should contain details of the price per ton as well as the total price c. & f. Khorramshahr or Bandar Shahpour. The issuing authority and address to which bids should be sent is the Iranian State Railways Administration, Tehran. The closing date is March 9, 1958. The Board of Trade reference is ESB/3259/58.

From Sudan:

20,000 bearing plates, special 75 lb.

The issuing authority is the Controller of Stores, Sudan Railways, Atbara. The tender No. is 1726. Delivery is required at the earliest possible date. The specification and relative drawings can be obtained on application from the Office of Controller of Stores, Atbara. The closing date is March 26, 1958. Tenders should be accompanied by a deposit of 2 per cent. The Board of Trade reference is ESB/3949/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

The India Supply Mission invites tenders for the supply of 77,500 tons of steel rails. See Official Notices on page 236.

The Special Register Information Service, Export Services Branch, Board of Trade, reports that the closing date of the call for tenders for main-line passenger coaches for South Africa, recorded on page 636 of our November 29, 1957, issue, has been postponed to June 6, 1958.

FURTHER LIFT FAILURE AT EUSTON UNDERGROUND STATION.—Two of the three lifts at Euston underground station, London Transport, failed again on February 17, a day after they had resumed service after being put out of action by a burst water main under the London Midland Region main-line station last week. The bus service between Mornington Crescent and Warren Street underground stations was resumed, but later the lifts were repaired, and the bus service withdrawn.

Notes and News

Institute of Transport Annual Dinner.—We regret that through a printer's error in our issue of January 31, the date of the annual dinner of the Institute of Transport was given as March 31 instead of March 21.

Silver City Airways Coach-Air-Rail Service.—Silver City Airways resumes its low-fare coach-air-rail services between London and Paris on May 21. Instead of two 44-seat services daily, as in 1957, this year there will be a single service daily with capacity for 100 people in each direction. Fares will be £8 19s. return, and £4 19s. single.

Summer Meeting of Institution of Locomotive Engineers.—The Summer Meeting of the Institution of Locomotive Engineers will be held in Ireland on May 12-15. Preliminary arrangements for the Meeting are as follow: In the evening of May 12, the main party will depart from London. On the morning of May 13, members will tour Harland & Wolff Limited Marine Engine Works at Belfast; they will then travel by train to Dublin, where the summer meeting dinner will be held at the Shelbourne Hotel. It is possible that mechanised production of peat of the Bord na Mona plant, at the Boora establishment, will be observed the following day. The final day, May 15, will allow the party to visit the Brewery of Arthur Guinness, Son & Co. Ltd., Dublin, and also the Inchicore Works of Coras Iompair Eireann. The main party will then travel overnight to London.

Stables Converted into Drawing Office.—The conversion of the former Mint stables adjoining Paddington Station, Western Region, British Railways, to provide additional drawing office accommodation for the Chief Civil Engineer's Department, Western Region, has now been completed. The work began on January 9, 1957, with the removal of stalls, mangers, and gas lighting equipment from the whole of the upper floor. Many of the old partition walls were retained and further partition walls, of single brick thickness, were added as required. The old timber truss roofs were generally retained; they were re-felted, re-slated, and internally lined. Connection between floors is provided by a completely enclosed self-trimming electric lift. The success of the scheme has since led to the conversion of the lower floor of the building for the Operating Department.

Locomotive Driver Charged with Manslaughter.—The driver of the steam-hauled express train which ran into the rear of the electric train in fog at Lewisham, Southern Region, on December 4, has been charged with manslaughter. A summons, applied for by the Director of Public Prosecutions, Sir Theobald Mathew, was granted by a London magistrate. It was served on the driver, Mr. W. Trew, on February 17, and will be heard at Lewisham next month. Charges of manslaughter against railway servants have been seldom heard of during the present century. In 1952 a verdict of guilty was secured in the case of the gatekeeper at the Riccall Crossing, where a motor car was run down with fatal results.

"Caledonian" to be Duplicated.—The "Caledonian," now running daily (Mondays to Fridays) each way between Euston and Glasgow Central, is to run twice daily as from June 9, on introduction of the summer timetable. The additional northbound train will leave Euston at 7.45 a.m.; the new southbound "Caledonian," it is stated, will leave Glasgow Central in the afternoon.

New N.E. Region Diesel Services.—The Multiple-unit diesel sets have taken over the North Eastern Region passenger service between Darlington and Barnard Castle, Kirkby Stephen, Appleby, and Penrith, as recorded in our February 7 issue. With its summit level of 1,370 ft. on Stainmore, this is now the maximum altitude worked over regularly by diesel trains in Great Britain, and the approach from the west to this summit, six miles at 1 in 59-60 and 2¼ miles at 1 in 67-72 continuously from Kirkby Stephen is also the longest incline of such severity that trains of this type have yet had to tackle in ordinary service. Substantial accelerations have been effected. For instance, the 6.18 a.m. from Darlington starts 5 min. later and reaches Penrith at 8.22 a.m., 18 min. earlier, thereby making a connection to Carlisle, arriving 75 min. earlier than previously. The 10 a.m. from Darlington starts at 10.40 a.m., with connections from York and Newcastle respectively 76 and 60 min. later than previously, and reaches Penrith at 12.47 p.m., 25 min. later than hitherto.

Technical Co-operation between U.S.S.R. and Hungary.—Documentation on, *inter alia*, the manufacture of railway rolling stock and machine tools is being made available by the Russian Government to the industries concerned in Hungary. Information on machine tool manufacture and techniques is also being sent to the U.S.S.R. from Hungary, in which latter country representatives of Russian industries are to study construction of various types of machinery and methods of fuel utilisation.

Crewe Pupils & Apprentices Association.—The annual dinner of past and present Crewe pupils, premium apprentices and engineering apprentices is being revived, and the 51st dinner is to be held at the Royal Automobile Club, Pall Mall, London, S.W.1, on March 21. As accommodation at the Club is limited, any former Crewe man who has not received a notice should apply immediately to Mr. F. B. Roberts, Hon. Secretary, Crewe Pupils & Apprentices Association, 36, Bedford Street, London, W.C.2. The 50th dinner was held at Crewe in 1953, and apart from interruptions caused by two wars, the tradition goes back 70 years.

London Transport Players.—"White Horse Inn," the famous and spectacular musical comedy by Hans Muller, music by Ralph Benatzky and Robert Stolz, was presented by the London Transport Players at the Scala Theatre, London, on Wednesday, Thursday, Friday, and Saturday of last week. This musical comedy is well within the scope of the outstanding ability of the cast, and the chorus and dancers gave excellent performances and appeared to be really enjoying themselves. The principal parts were played by Michael Dowse as Leopold, head waiter at the Inn, Joan Partington as Josepha, owner of the Inn, Charles Perks, excellent as John Ebeneser Grinkle, a North Country manufacturer, Heather Holford, as his daughter Ottoline and Tony Ayres as Valentine Sutton. Comedy was provided by Richard Smith as Sigismund Smith. Other principal players included Yvonne Nicholls as

Part of the new drawing office at Paddington, converted from stables

Mint stable before conversion

Kathi, the postwoman; Brian Orton, as Karl, piccolo at the "White Horse Inn"; Ray Ravenswood, a forester; Doria Harrison as Zenzi, a goatherd; William Cooper, as Professor Hinzel; Elsie Staerck, as Gretel, his daughter; Albert Thompson as the Mayor; Rosetta McDougall, the Mayor's secretary; and Rowland Wale as the Emperor. Great credit is due to John Pinches, the musical director, for the smooth running of the show. The entire production was staged and devised by Eva Callebaut, and the choreographer was Olive Hurford.

Queensland Development Mission.—The Queensland Government is sending a mission to Britain in April to draw attention to plans for development and to explore the prospects for manufacture in Queensland of United Kingdom goods. The mission will study development areas in the U.K. with a view to introducing similar facilities for industry in Queensland. It will be headed by Mr. K. J. Morris, Deputy Premier of Queensland, and Minister for Labour & Industry, and will include Mr. J. R. L. Hyne, Director of Walker Bros. Ltd.

Birmingham-built Diesels in Ghana.—The first of the Birmingham Railway Carriage & Wagon Co. Ltd. general purpose Bo-Bo locomotives, powered by Paxman 12-cylinder, 7-in. bore, 410 HP engines, was put into operation by the Railways & Harbours Administration, in June 1957. By the end of the year, all 13 locomotives were being used regularly on shunting, in inland and port areas, local and main-line passenger trains, operating between Takoradi, Kumasi, and Accra, including the lightweight "Blue Train" built by Cravens Limited. During the six months under record, the first locomotive had completed 1,025 hr. (23,000 miles). Eight others passed the first 500-hr. inspection; the only parts renewed were replacement joints.

British Railway's "Duke" Steamer to Cruise in English Channel.—The *Duke of Lancaster* is to begin a weekend cruise from Heysham and Dublin on May 30, passing down the West Coast, round Lands End, and up the English Channel to Southampton, with arrival on June 2. The cost will be £12 from Heysham and £10 from Dublin, with all meals included. British Railways, London Midland Region, have added some amenities to the vessel in providing accommodation for 300 passengers. The *Duke of Lancaster* is also to make six-day sightseeing cruises from Southampton to the Dutch, Belgian, and French coasts, with shore excursions, on June 7, 14, and 21, inclusive fares from £24.

More Diesel Services in the West Riding.—New and extended diesel services in the West Riding from March 3, are announced by the North Eastern Region of British Railways. Through diesel services between Leeds, Normanton, Wakefield, and Barnsley are to be introduced. There will be 15 trains in each direction, approximately at hourly intervals; on Sundays the service will be approximately two-hourly. Most of the diesel trains now running between Leeds and Castleford will be extended to Pontefract, and some existing services between Wakefield and Bradford will be extended to Pontefract and Goole. There will be one service each day from Bradford through to Hull and one service from Wakefield will also be extended to run through to Hull. Both the new Leeds-Normanton-Wakefield-Barnsley and the extended Leeds-Castleford-Pontefract services are designed to give good connections at Wakefield Kirkgate and Pontefract respectively with the Bradford-Wakefield-Pontefract-Goole services. The existing steam trains which give direct services between Huddersfield and Wakefield Westgate, connecting with the principal Leeds-Kings Cross trains, are to be replaced by diesels.

New Underline Bridge Collapses in Edinburgh.—A 60-ton prefabricated steel and concrete underline bridge about to be placed across Brand Place, Abbeyhill, Edinburgh, on the Abbeyhill loop line, Scottish Region, on February 17, is reported to have slipped from its abutment and fallen on to the road below. The accident caused considerable dislocation to freight services and a shuttle service of buses was run for passengers.

Increase in English Electric Co. Ltd. Profits.—The group profits of the English Electric Co. Ltd. rose from £6,735,195 to £6,916,989 for 1957. As forecast, the dividend on the increased ordinary capital is maintained at 14 per cent, with a 10 per cent final dividend. Depreciation charged in arriving at the profit was higher than for the previous year by some £484,500, at £2,775,985. After tax and transferring relief on capital alowances in excess of depreciation to reserve, the profit attributable to the company is £2,951,285, compared with £2,911,812.

Southern Region Services to S.E. London and Kent.—Five M.Ps. are reported to have met Sir Brian Robertson, Chairman of the British Transport Commission, on February 17, to discuss complaints of travelling conditions in the Southern Region between London, the south east suburbs, and Kent. Sir Brian Robertson told them that an appreciation of the whole problem presented by the increasing peak-hour traffic between residential areas of Kent and London was in preparation. It would be presented to Mr. Harold Watkinson, Minister of Transport & Civil Aviation, as soon as possible.

Liquidation of the Barsi Light Railway Company.—The liquidators of the Barsi Light Railway Co. Ltd. state that the accounts for the year ended November 23, 1957, do not include the interest payable by the Government of India on the purchase price not paid on the due date in accordance with the contract under which the railway was acquired. The amount claimed is about £30,500, but the Government of India disputes this on the ground that it is not responsible for interest during the period of the various prohibitory orders arising from the claims made by labour against the company. The liquidators dispute the compensation amount of £5,348 which the Government consider is the only amount payable.

Vulcan Foundry Limited Loss in 1957.—Vulcan Limited is not paying an ordinary dividend for the year ended December 28, 1957, compared with 10 per cent previously. The group loss was £286,497, against a profit of £139,469. The loss is arrived at after deduction of all charges, other than tax, including £74,408 (£62,689) for depreciation. Subvention payments from the English Electric Co. Ltd. of £335,000 cover losses for the year. U.K. tax absorbs £2,000 (£64,662) and tax relief of £20,000 (£30,000) goes to general reserve (capital reserve a year ago). The group profit, after all charges and crediting subvention payments, is £26,503, against £44,807. A year's preference dividend again absorbs £2,875. A half year's preference dividend to December 31, 1957, will be paid on March 31.

Hi-Dyne Diesel Engines.—Davey, Paxman & Co., Ltd., wishes it to be known that the registered name Hi-Dyne, as applied to the diesel engines manufactured by the firm, has no connection with the fuel which was used for the rockets carrying the United States satellite "Explorer."

Advice on Timber from T.D.A.—The Regional Office of the Timber Development Association at 8, St. George's Place, Brighton, has been closed and transferred to the head office of the Association. Advice on timber and timber construction is now the responsibility of the Regional Officer and the technical staff at 21, College Hill, London, E.C.4, telephone City 4771.

Motorcar Manufacture at Former G.N.R. (I) Works.—Dundalk Engineering Works Limited, the company which has taken over the former Great Northern Railway (Ireland) locomotive, carriage, and wagon works at Dundalk, is reported to be negotiating to manufacture Heinkel motorcars under licence. Editorial reference to the taking over of the works from the G.N.R. was made in our January 17 issue.

B.T.C. Film Gains Academy Award.—The British Transport Commission colour film "Journey into Spring" has received the British Film Academy award for the best documentary film for 1957, from any source, British or foreign. Produced by Ian Ferguson, directed by Ralph Keene, and made by the B.T.C. Film Unit, under the direction of Edgar Anstey, the film reveals the natural beauty of southern England as exemplified by the Hampshire village of Selborne, home of the naturalist Gilbert White. The purpose of the film is to stimulate travel.

Advisory Council on Middle East Trade.—Sir David Eccles, President of the Board of Trade, has decided to make new arrangements to keep the Government in touch with representatives of industry and commerce who have practical experience of selling in the Middle East. An Advisory Council on Middle East Trade will be set up under the chairmanship of Mr. J. Vaughan-Morgan, Minister of State, Board of Trade; Mr. W. H. Fadzean, of British Insulated Callender's Cables Limited, has agreed to be vice-chairman and industrial leader of the council.

Diesel Railcar Connections with Edinburgh Airport.—The possibility of a fast diesel railcar service linking Perth and Dundee with Turnhouse Airport, as an alternative to a feeder air service from Errol, is to be discussed between British Railways, Scottish Region, and the Convention of Royal Burghs' Transport & Roads Committee. Referring to the fact that the campaign for the reopening of Errol aerodrome has been unsuccessful because of the estimated annual loss, Mr. J. Gibson Kerr, the committee agent, has stated that there are two other possibilities. One is the use of Leuchars, which is already being investigated, and the other a fast diesel car twice a day from Dundee and Perth to Turnhouse. Errol airport adjoins the Perth-Dundee line of the former Caledonian Railway. Leuchars and Turnhouse airports are near the Edinburgh-Dundee-Aberdeen main line of the former North British Railway.

Forthcoming Meetings

February 26 (*Wed.*).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, 1, Birdcage Walk, Westminster, S.W.1, at 5.30 p.m. The Sir Seymour Biscoe Tritton Lecture by Mr. E. Upmark, Director General, Swedish State Railways: "Development of electric traction in Sweden and its influence on rolling stock."

February 27 (*Thu.*).—Institution of Mechanical Engineers, at 1, Birdcage Walk, Westminster, S.W.1, at 6 p.m. Discussion: "Are we satisfied with the quality of fuel at present available for high-speed diesel engines?"

February 27 (*Thu.*).—British Railways, Southern Region, Lecture & Debating Society, at the Golden Arrow Club at Orpington, at 6 p.m. A selection of interesting films from the Transport Film Library.

February 27 (*Thu.*).—Institute of Transport, Bournemouth & Poole Group, at the Town Hall, Bournemouth, at 6 p.m. Debate: "Road versus rail."

February 27 (*Thu.*).—Institute of Transport, South Eastern Group, at the Royal Star Hotel, Maidstone, at 7.15 p.m. Paper on "Air ferry integration with surface transport for the carriage of passengers," by Mr. J. Hawkes (Graduate).

February 28 (*Fri.*).—Institution of Railway Signal Engineers, Bristol Section, in the Meeting Room, above main booking hall, Temple Meads Station, at 6 p.m. Paper on "Train describers," by Mr. M. E. Reach.

March 3 (*Mon.*).—Institute of Transport, Metropolitan Section, at 80, Portland Place, London, W.1, at 5.30 for 6 p.m. Paper on "Modern rolling stock," by Mr. L. B. Alexander.

March 3 (*Mon.*).—Historical Model Railway Society, at the Railway Tavern, Liverpool Street, London, E.C.2, at 7 p.m. Paper on "The Claughtons' of the London & North Western Railway," by Mr. R. M. Tomkins.

March 3 (*Mon.*).—Railway Correspondence & Travel Society, West Riding Branch, at the Talbot Hotel, 45, Kirkgate, Bradford, at 7.30 p.m. Paper on "Rail transport in the Somerset coalfield," illustrated by lantern slides, by Mr. W. R. Dyer.

March 3 (*Mon.*).—Railway Correspondence & Travel Society, Sheffield Branch, at the Livesey-Clegg House, Union Street, Sheffield, at 7.30 p.m. Paper on "The North Eastern Railway," by Mr. T. Rounthwaite.

March 4 (*Tue.*).—Permanent Way Institution, Leeds & Bradford Section, in the British Railways Social & Recreation Club, Ellis Court, Leeds City Station, at 7 p.m. Paper on "Further developments in civil engineering plant," by Mr. A. C. Rayke, Plant Assistant to the Chief Civil Engineer, North Eastern Region.

March 5 (*Wed.*).—British Railways, Southern Region, at the Chapter House, St. Thomas' Street, London, S.E.1, at 6 p.m. Paper on "The nationalised gas industry," illustrated by lantern slides, by Miss M. L. Burgess, member of Institute of Journalists.

March 5 (*Wed.*).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Toft Green, York, at 5.30 p.m. Paper on "Developments in telecommunications in relation to the modernisation and electrification programme," by Mr. P. W. Hanstock.

March 6 (*Thu.*).—British Railways, Western Region, London Lecture & Debating Society, at Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Paper on "Work study," illustrated by lantern slides, by Mr. K. G. Kenrick, Associated Industrial Consultants Ltd.

March 6 (*Thu.*).—Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "Spanish Railways," by Mr. L. G. Marshall.

March 7 (*Fri.*).—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Paper on "Some features of Continental signalling instructions," by Mr. T. S. Lascelles.

Railway Stock Market

The uncertainty in stock markets has been increased by speculation on the political outlook caused by the Rochdale by-election result, though in the City there is widespread confidence that a general election is unlikely this year. Buying interest again centred almost entirely on British Funds once again, and in contrast industrial shares have moved against holders, largely because of the many indications of increasing competition in the home market and fears of more difficult conditions in export trade. The prevailing belief is that the business recession in the U.S.A. is likely to persist for some months and that in the circumstances, it will be more difficult to earn dollars.

Bearing in mind the general trend in markets, it is not surprising that where changed, foreign rails moved against holders; but in most cases the amount of business has been hardly sufficient to test quotations. Antofagasta ordinary, one of the few stocks in which there was a fair amount of business has, however, fallen sharply on balance from 17 to 15¼, and now shows a yield of over 25 per cent on the basis of last year's 4 per cent dividend, while the 5 per cent preference stock lost a point at 36.

United of Havana second income stock kept at last week's lower price of 6, and the consolidated stock was again 1¼. Chilean Northern first debentures were 35¼. Costa Rica ordinary stock was 16½ and the first debentures were quoted at 70½, though business was recorded up to 72. International of Central America common shares were $22½ and the preferred stock $127½.

Brazil Railway bonds kept at 5½. San Paulo 3s. units were 2s., compared with 2s. 1½d. a week ago; elsewhere, Mexican Central "A" bearer debentures eased to 66½.

Barsi Light Railway stock was quoted at 16. Midland of Western Australia ordinary stock was 7½. In other directions, Nyasaland Railways shares eased to 10s. and the 3½ per cent debentures were 59½.

Canadian Pacifics have receded from $47½ to $46, the preference stock at 54½ was virtually the same as a week ago, but the 4 per cent debentures came back from 65½ to 64¾. White Pass shares declined from $14½ to $13⅜—their lowest this year.

Among shares of companies connected with locomotive building and equipment, English Electric have been firm, and at 46s. 6d. were slightly higher on balance in response to the excellent impression created by the higher profits and the maintenance of the dividend at 14 per cent on the larger capital. The latter was in accordance with the forecasts made by Sir George Nelson, the Chairman. Associated Electrical at 48s. 3d. were virtually the same as a week ago, but General Electric came back to 31s. Westinghouse were active again, and at 36s. continued to hold all but a few pence of their recent good advance. Charles Roberts 5s. shares strengthened to 8s. from 8s. 3d. and Wagon Repairs were more active, particularly the new shares around 10s. 6d. Gloucester Wagon firmed up to 13s. 9d., Beyer Peacock 5s. shares receded from 8s. to 7s. 7½d. G. D. Peters were again quoted at 27s. 6d. and at Glasgow, Hurst Nelson strengthened to 26s. 4½d., but North British Locomotive lost 1s, at 11s. 3d. Birmingham Wagon came back from 17s. 3d. to 16s. 10½d.

Reflecting the easier trend in markets generally, British Timken were 45s. 9d., compared with 46s. 3d., Tube Investments went back from 51s. to 48s. 9d., B.S.A. were 25s., Pressed Steel 5s. shares 12s. 10½d. and Leyland Motors were 43s. 6d. helped by the past year's higher profits. T. W. Ward at 72s. 9d. have been little changed compared with a week ago, but British Oxygen became easier at 29s. 9d. Ruston & Hornsby reacted to 23s. 6d. at which there is a yield of over 7½ per cent on last year's 9 per cent dividend.

OFFICIAL NOTICES

THE NIGERIAN RAILWAY CORPORATION invites applications for the following post: ASSISTANT ENGINEER. *Duties:* An Assistant Engineer may be required to take charge of an engineering sub-district on the Railway or to work under a District Engineer or Resident Engineer on Capital Works. *Qualifications:* Candidates should have had two years' or more post graduate experience of Railway engineering or in heavy engineering or general building construction. They should preferably be Associate Members of the Institution of Civil Engineers or possess an Engineering Degree recognised as granting exemption from Parts I and II of that Institution's examination, or have had five years' experience of general construction work preferably in connection with a railway. *Salary:* In scale £1,100 by £50 per annum to £1,900 (inclusive of Overseas Pay) per annum. Starting salary according to qualifications and experience. Appointments may be on pensionable terms or on contract with a gratuity payable on completion of contract at the rate of £18 6s. 8d. to £31 13s. 4d. for each completed month of service. *Tours:* 15 months in Nigeria followed by 15 weeks' leave on full pay. *Quarters:* Partly furnished quarters are provided at low rental. *Allowances:* £60 Outfit Allowance on first appointment and Children's Allowance of £75 a child up to two children under 18 years. Send postcard mentioning the post and this paper for further particulars and application form, to: The London Representative, Nigerian Railway Corporation, 9, Northumberland Avenue, London, W.C.2.

THE Proprietors of British Patent No. 680,644, relating to Improvements in Ballast Tamping Machines for Railway Tracks, are willing to grant licences for the commercial exploitation of the invention in the United Kingdom.—Lloyd Wise, Bouly & Haig, 10 New Court, Lincoln's Inn, London, W.C.2.

FOR SALE.—RAILWAY CARRIAGE AND WAGON TRAVERSER, 40 ton pit type, electric, 45 ft. long (could be extended by the purchasers if desired), 3 ft. 6 in. gauge. Speed—Travelling 150 ft., Hauling 75 ft. per minute. Electrical equipment 400 v., 3 phase, 50 cycles. Motor 25 b.h.p. Makers—Ransomes & Rapier Ltd. Installed at Takoradi, Ghana. Unused and in excellent condition. Price £5,500 f.o.b. Takoradi.—For further particulars apply to Crown Agents, 4 Millbank, London, S.W.1. (Ref. O/PROD. 1791.)

THE Indian Supply Mission for India invites tenders for the supply of: 77,500 Long Tons STEEL RAILS, 90 lbs., 60 lbs., 50 lbs. Flat Bottom, Revised British Standard. Section in accordance with that in B.S.S. 11-55. Forms of tender may be obtained from the Director General, India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3. Tenders are to be posted direct to India Supply Mission, 2536 Massachusetts Avenue N.W., Washington 8, D.C., to reach there by 9.15 a.m. on 27th March, 1958. Please quote reference No. S.5107/57 CB/RLY.